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GOOD NEWS FOR SCI-TECH WORKERS

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Xi Plants Trees for 10th Year as Top Leader

President Xi Jinping planted trees in Beijing on March 30, marking the 10th year of his participation as the top leader in the annual tree-planting activity in the Chinese capital.

Xi said he did so to make his contribution to building a beautiful China and to encourage the whole of society, especially the young people, to push for ecological advancement so that China's environment will become even better.

The activity was also attended by other leaders. The leaders planted trees with people from Beijing at a city park in the southern district of Daxing.

While planting saplings of different types of trees, Xi asked the young students around him about their studies, motivated them to foster a sense of hard work, and told them to boost their awareness of the need to protect the environment and conserve resources.

"Since the 18th CPC National Congress, we have adhered to the notion that lucid waters and lush mountains are invaluable assets to fully promote the development of ecological civilization, advance afforestation and improve living environment in both urban and rural areas," Xi said, adding that "A beautiful China is becoming a reality."

The president also stressed continuous and arduous efforts to protect and restore the ecological system and achieve the fundamental improvement of the environment.

Xi pointed out that forests are crucial to conserving water, obtaining economic benefits, and safeguarding grain security, stressing that their vital role as carbon pools should also be valued.

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Staff members operate a drone in the field of a smart farm in Jiangxiang town, Nanchang county of east China's Jiangxi province. (PHOTO: XINHUA)

International Cooperation

China Awards Top Cooperation Honor to Foreign Scientists

By LI Hongce and TANG Zhexiao

China has bestowed its 2020 International Science and Technology Cooperation Award (ISTC Award) to eight foreign scientists from seven countries and the International Center for Tropical Agriculture. Due to the pandemic, the 2020 awards ceremony was held retrospectively by the Chinese embassies abroad.

The ISTC Award, recognizing scientists and institutions that have made great contributions to sci-tech progress of China, is a state-level annual award established by the State Council in 1994.

At the ceremony hosted on March 28 at the Chinese Embassy in France, Jacques P. Caen, a haematologist, and Alain J. Becoulet, a physicist specializing in fusion energy, received the award from Chinese Ambassador Lu Shaye.

Becoulet expressed his gratitude to the Chinese government and the Chinese Embassy in France, with special thanks to scientists in China's Hefei Institutes of Physical Science with whom he worked together.

"Science and technology can break through the obstacles of history, culture and the economy, narrow the distance between different ethnic groups, and jointly meet with the challenges of the times," he said, adding that, "I'm honored to witness the close cooperation and major achievements in the field of nuclear fusion research between China and France. We will continue to do a good job in international exchanges and cooperation for the common bright future of mankind."

Australian geoscientist Sue O'Reilly received the award from the Chinese Embassy in Canberra on March 24. Prof. O'Reilly has been committed to research collaborations in geosciences with Chinese universities and institutes since 1982. She has visited China many times and made important contributions to the development of China's geosciences, according to Chinese Ambassador to Australia Xiao Qian.

"This award proves that scientific collaboration is an important way to build lasting international bonds in a changing world, and we have a responsibility to shape the future together," said O'Reilly, a 76 year-old professor.

Xiao said that the door between China and Australia for exchanges and cooperation in science and technology was opened as early as 1960s, and the cooperation has, "promoted the advancement of science and technology undertakings and economic and social development of the two countries."

To date, 136 foreign experts, three international organizations and one foreign organization have won the ISTC Award.

Professor O'Reilly received the ISTC Award from Chinese Ambassador Xiao Qian. (PHOTO: THE EMBASSY OF THE PEOPLE'S REPUBLIC OF CHINA IN THE COMMONWEALTH OF AUSTRALIA)

Editor's Pick

Digital Villages: New Way to Common Prosperity

By WANG Xiaoxia

"To get rich, build roads first," was a slogan used to develop rural areas in China. Today, various networks are becoming the new roads for villagers to become more prosperous.

China's administrative villages had all been connected to broadband networks by the end of last year, which paves the way for construction of digital villages.

Digital villages, by promoting the application of digital technologies in rural areas, will boost the modernization of agricultural production and public services in rural areas, and narrow the urban-rural development gap.

Smart agriculture and farming

Smart agriculture is reshaping the traditional way of agricultural production from experience-based to data-driven.

At Changping pig farm in Yuqing county, southwest China's Guizhou province, an ear tag with a sensor board is attached to the ear lobe of individual pigs to measure vital parameters and send the data through a smartphone app to the cloud.

The big data system remotely monitors all the pigs on the farm and provides early alerts to the farm caretaker for situation that needs immediate attention.

Previously, the diagnosis of pig diseases could only be made after symptoms emerge, while the optimal treatment period has already been missed, said the farm manager Fei Rufen, adding that with a superior alert system, the survival rate of last drove of pigs has surpassed 96 percent.

Apart from the production process, digital tools are applied to products circulation, operation and supervision, which help agricultural products flow to the market more freely, increasing villagers' incomes.

In Baoding city, north China's Hebei province, all the villages get access to e-commerce services and the city's rural online retail sales reached 26.3 billion RMB in 2021, while the national volume exceeded two trillion RMB.

Improvement of public services

The application of digital technology has narrowed the gap between urban and rural areas in terms of healthcare, education and other public services.

Data from the Ministry of Industry and Information Technology shows that all primary and secondary schools (including teaching sites) across the country had broadband access in 2021.

In Baoding, online class connected pupils from rural schools with urban classrooms. "Thanks to the online guidance, my English pronunciation has improved a lot," said Li Zehan from Mingde primary school in Tuonan, a small town in the city.

Telemedicine platforms have been established in 29 provinces, and telemedicine services covered more than 90 percent of Chinese counties, districts and municipalities in 2021, according to the National Health Commission. ***See page 2***

Super Gene to Increase Grain Yield

By Staff Reporters

A joint group of scientists from Huazhong Agricultural University (HZAU) and China Agricultural University (CAU) have found a gene in both corn and rice, which could boost the grain yield by 10 percent and eight percent respectively when it is properly edited.

The gene in corn is named KRN2, and its ortholog in rice is called OsKRN2. Both underwent selection in the process of domestication and improvement, resulting in the reduction of their expression and an increased grain number through an increase in kernel rows.

Grain yield was raised by the knockout of KRN2 in corn, or OsKRN2 in rice as demonstrated by field tests, while other agronomic traits were not obviously compromised.

The scientists also conducted a deep analysis of the scope and mechanism concerning the convergent selection of corn and rice on a genome-wide scale. They identified a set of 490 orthologous genes that underwent convergent selection in the evolution of corn and rice, including KRN2/OsKRN2. These genes were significantly enriched in starch and sucrose metabolism, and in biosynthesis of cofactors.

Starch is the core ingredient that stores energy in crop seeds, which is an important reason for corn and rice to be domesticated as major food crops. The result of the research not only helps to better understand the evolution and improvement of crops, but also offers valuable information for accelerating the breeding process of crops and creating new crops via domestication.

From the perspectives of both gene and genome research, it took the joint group 18 years to reach this discovery and answer an important question of basic science. That is whether corn, rice and wheat, which offer more than 50 percent of the energy used by human beings, follow the same heredity laws in the long process of improvement and selection, since they are domesticated in different locations around the world with various ancestors.

Published in *Science* online on March 25, the study provided a crucial theory foundation for the analysis of mechanisms regarding crop domestication and breeding in the future.

ICV's Testing Speeds up

By Staff Reporters

Currently, the length of roads open for safety testing intelligent connected vehicles (ICV) in China exceeds 5,000 km and the total distance of such tests surpassed 10 million km, said Guo Shougang, an official from the Ministry of Industry and Information Technology (MIIT), at a forum held in Beijing on March 25.

According to Guo, the Ministry of Housing and Urban- Rural Development (MOHURD) and MIIT have jointly conducted pilot projects in 16 cities, in order to promote the coordinated development of smart city infrastructure and ICV.

Beijing was among the first batch of cities used for the pilot projects. Kong Lei, deputy director of the Beijing Economic and Technological Development Area (BDA) Administrative Committee, noted that Beijing began the construction of an internet-connected and cloud-control high - level autonomous driving demonstration zone in September 2020.

Phase 2.0 construction of the demonstration zone was basically completed, said Kong. ***See page 4***

WEEKLY REVIEW

Top 10 Archaeological Discoveries Revealed

China's Top 10 New Archaeological Discoveries of 2021 was released on Mar. 31. The highlighted discoveries included the exotic-looking gold and bronze masks from the Sanxingdui Ruins site in Sichuan province, and the most complete preservation of prehistoric wooden structure found in Jijiao city site in Hunan province.

National Energy Targets for 2022 Set

China has pledged to increase the share of non-fossil fuel in overall energy consumption to around 17.3 percent in 2022, with wind power and photovoltaic power generation accounting for about 12.2 percent, according to a guideline released by National Energy Administration on Mar. 29.

China Firstly Lead IEC Standards Revision

The International Electronics Commission (IEC) officially issued two quality standards of IEC IEC60477- 1: 2022 and IEC60477-2: 2022 recently. This was the first time that IEC international standards in electromagnetic laboratory measurement revised under the leadership of China.

Mouse Brain Research Made Significant Progress

Researchers from China have established the world's largest database of mouse single-neuron whole brain projectome, revealing the diversity of prefrontal neurons and providing organizing principles of neural circuits research. The study was published in *Nature Neuroscience* on Mar. 31.

WECHAT ACCOUNT E-PAPER

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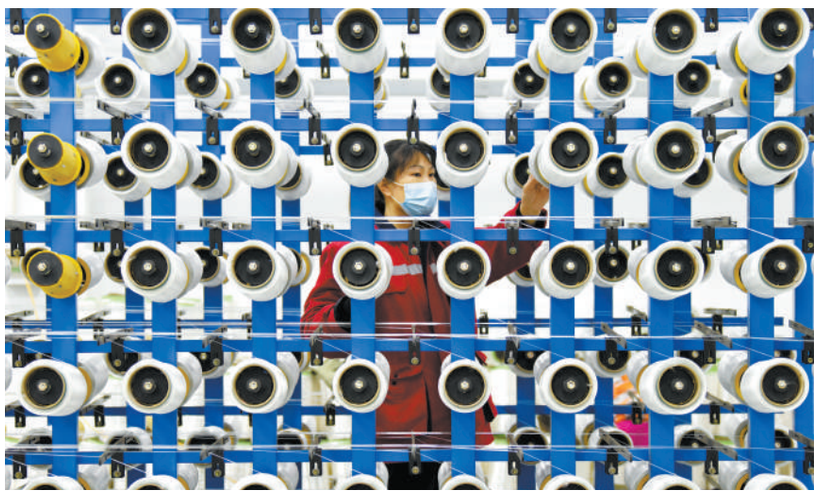
Key Tasks Set for 2022, Innovation and Cooperation Highlighted

By LI Linxu



A bullet-proof UD cloth plant in a high-tech company in Hebei province. (PHOTO: XINHUA)

Following the conclusion of the Two Sessions, work division on key tasks has been laid out for implementing 2022 Government Work Report, according to a circular released by the State Council on March 25.

To achieve this year's economic and social goals, the circular proposed a total of 52 major tasks in 44 aspects.

These tasks have been assigned to relevant ministries and departments in line with their function, with a clear-cut deadline.

The main targets set in the government work report include increasing GDP by around 5.5 percent, creating over 110 million new urban jobs, maintaining a CPI increase of around 3 percent, and achieving personal income rises basically in step with economic growth. Meanwhile, maintaining stability and improving quality in imports and exports, keeping grain output at more than 500 million metric tons, continuously improving ecological and environmental quality, and lowering the discharge of major pollutants are also among the main targets.

To fulfill these expected targets, China will pursue prudent and effective macro policies, micro policies that can continuously energize market entities, and structural policies that facilitate smooth flows in the economy, noted the circular.

Moreover, sci-tech policies should be fully implemented, reform and opening up policies should lend impetus to development, and regional policies should ensure more balanced and coordinated development, stressed the document.

It will further implement the innovation-driven development strategy and strengthen the foundation of the real economy.

To raise the country's capacity for sci-tech innovation, China will press ahead with the 10-year action plan on basic research to ensure stable support over the long term, and increase the share of basic research spending in the country's total R&D expenditures.

In 2021, China's spending on basic research rose 15.6 percent to 169.6 billion RMB. Its proportion to total R&D expenditure stood at 6.09 percent and is expected to increase to a record eight percent by the end of 2025.

The country will implement a three-year action plan for reforming the sci-tech management system, reinforce the country's strategic sci-tech capabilities, further develop national key laboratories, and leverage the strengths of universities, colleges, and research institutes.

It will also improve the approval procedures for major sci-tech projects and their management, and further reform the assessment and incentive systems for scientific research.

In the meantime, China will provide stronger incentives to promote innovation among enterprises, reinforce the principal position of enterprises in innovation, and strengthen intellectual property rights protection and application.

Engaging in international sci-tech cooperation, and stepping up efforts to build talent centers and innovation hubs of global importance are also highlighted in the circular.

Green Hydrogen Powers China's Energy Future

By ZHONG Jianli

At the recently concluded Beijing 2022 Winter Olympics and Paralympics, hydrogen energy was used in various fields, such as fueling the torches and vehicles, demonstrating the wider application of the green, low-carbon energy.

China plans to further promote the construction of hydrogen energy infrastructure and expand its applications. By 2025, the hydrogen produced from renewable energy sources should become an essential part of the energy structure, according to the *Medium and Long-Term Plan for the Development of Hydrogen Energy Industry (2021-2035)*, recently issued by the National Development and Reform Commission and the National Energy Administration (NEA).

A hydrogen-powered bus in Qingdao, east China's Shandong province. (PHOTO: VCG)

Green hydrogen vs. grey hydrogen

The plan's goal is that by 2025, the hydrogen produced from renewable energy sources should reach 100,000 to 200,000 tons per year, helping to reduce the carbon dioxide emission of one to two million tons per year.

According to statistics of China Hydrogen Industry Alliance and China National Petroleum & Chemical Planning Institute, China's hydrogen production capacity is about 40 million tons per year, and the output is about 33 million tons per year. However, most of the hydrogen is produced from fossil fuels or industrial by-products, which is regarded as grey hydrogen. Specifically, nearly 80 percent of hydrogen is produced from coal or natural gas, while that produced from renewable energy, or green hydrogen, is even less.

"The country will encourage the development of hydrogen produced from renewable energy in areas rich in wind, solar and hydro power," said Liu Yafang, deputy director of the science and technology department of NEA, adding that the proportion of green hydrogen will continue to increase in the future.

Diversified applications

Currently, most of the hydrogen energy is used in transportation, and progress of using the energy in other fields has been slow.

The plan proposes to steadily promote diversified demonstration applications of hydrogen energy, by using it in energy storage, distributed power generation, and industries.

For example, given that hydrogen energy can be stored in large capacity for a long period, a new integrated application model of "wind-solar-hydro-power plus hydrogen energy storage" can be explored and developed.

Technological breakthroughs

The hydrogen energy industry chain is longer and related technologies are more difficult. Compared with the international level, China still has room for improvement in terms of key basic materials, core components, scientific mechanisms of hydrogen safety, and hydrogen professionals.

Thus, the plan calls for strengthening basic research, key and disruptive technologies innovation, building a professional team, and establishing multi-level and diversified innovation platforms to form a more collaborative and efficient innovation system, so as to improve the competitiveness of the hydrogen energy industry.

The plan also encourages the international joint R&D of hydrogen energy science and technology, participation in international hydrogen energy standardization activities, and cooperation with the Belt and Road Initiative countries in carrying out hydrogen energy trade, infrastructure construction, and product development.

Xinjiang Livestock Get New Tech Injection

By Staff Reporters

As a local custom, seven million heads of livestock in the Xinjiang Uygur Autonomous Region have recently begun their annual migration to spring pastures.

Now, to assist with development, the traditional animal husbandry industry in Xinjiang is seeking the help of science and technology.

Leveraging the Internet of Things, cloud computing, and other technologies, the Tianlai Beef Cattle Breeding Base in Xinjiang has set up an intelligent breeding management system, where the number of prime beef cattle increases by 20-30 percent each year.

Technology not only makes the livestock farming industry more efficient, but also extends its industrial chain.

One example is in Altay, where the locally developed physical sterilization method of biofilter helps keep camel milk fresh. With this method, the active nutrients in camel milk are retained, and the shelf life of camel milk is extended from less than seven days to six months. The per capita income of farmers is increased by more than 6,000 RMB each year.

The animal hair rapid detector is another area that has been developed and promoted by Xinjiang Academy of Animal Sciences.

It can complete the detection of the fineness, length, and net cashmere rate of the hair in 10 seconds, which previously took 3-5 days. The finer cashmere extracted by the machine can be processed into high-end textile products with higher value.

At present, Xinjiang has established a circular economy industrial chain and a digitalized supervision system, which can trace the whole process of animal breeding, epidemic prevention, product processing, and marketing, laying a solid foundation for sustainable development of livestock farming in the region.

Policy Watch

Good News for Sci-tech Workers

By CHEN Chunyou

Fostering an innovative and professional workforce is crucial for national sci-tech innovation, something China is keenly aware of.

The Sci-tech Workers' Day, on May 30 each year, was written into the revised *Law on Progress of Science and Technology*. Thus its importance was heightened. It reflects China's people-centered development philosophy, and greatly enhances the sense of pride within the circle of sci-tech workers.

In order to motivate researchers to climb up sci-tech peak, many policies that benefit researchers are put forward in this revised law. Article 68 says that China encourages sci-tech personnel to explore freely and take risks, and calls for a favorable atmosphere that inspires innovation and tolerates failure.

The researchers, engaged in pioneering and high-risk projects, would be exempted from liability if they fail to achieve decent results, but they have to prove they had tried their utmost and fulfilled responsibilities, notes article 68. This will greatly enlarge the room for researchers to explore all possibilities.

To free researchers from administrative work, and ensure sufficient time for their research, article 64 rules that the burden of sci-tech personnel in project application, document material submission, and expense reimbursement should be reduced.

For the sake of better stimulating the enthusiasm of researchers, a reward mechanism is highlighted in this revised law. For example, article 60 calls on research institutions, universities and enterprises to introduce incentive measures, such as dividends, option incentives and stock rights.

In terms of talent protection, the revised law introduces a protection and restraint mechanism. Article 57 stipulates that unfair treatment to sci-tech personnel and their research achievements is strictly prohibited. In addition, article 109 says people who use their power to oppress, exclude or deliberately harass sci-tech personnel would be punished.

Chen Baoming, vice director of Scientific and Technological Talent Center at the Ministry of Science and Technology (MOST), said that incentives and protection of rights and interests are two indispensable aspects for researchers. Under the incentive mechanism, the more researchers contribute, the more they will benefit.

China fully respects the autonomy of research organizations, which may leave room for unfairness. Therefore, preventing researchers from being treated unfairly is not only to protect their rights and interests, but also a check and balance on the autonomy of the researchers' affiliated organizations, added Chen.

Previously, He Defang, deputy secretary-general at MOST, said that China still faces a shortage of strategic scientists, and the measures to train and use young researchers are still not adequate. In the revised law, the growth of young researchers is acknowledged. Article 66 stipulates that the identification, cultivation and utilization of young talent should act as indicators for assessing the sci-tech progress of research organizations.

According to the *China Science and Technology Talent Development Report 2020*, released in 2021, during the 13th Five-Year Plan period (2016-2020), more young people have become the major workforce in research.

In terms of stimulating the creativity of researchers, the classified evaluation system for researchers was emphasized. Article 63 says that China should implement a classified evaluation system based on the differences of research disciplines and the contribution of researchers.

In fact, China has always focused on the reform of the talent evaluation mechanism. According to MOST in late March, some research associations in the fields of math, physics, chemistry, computer science and medicine were chosen as pilot units in 2021. Over the past year, they all have established their own *Guidelines on Academic Evaluation Standards* and *Guidelines on the Code of Conduct for Research Activities*, and achieved preliminary results.

For example, Chinese Physical Society said that physical academic evaluation should not solely focus on the author's ranking. It is required to make a comprehensive and objective evaluation based on the novelty, academic influence, opinions of peer experts, quality of the publications or the patents, and quotation rate, while considering the different characteristics of theoretical research, experimental research, basic research and applied research.

Researchers carry out experiments at the Yazhou Bay Seed Laboratory in Hainan province. (PHOTO: VCG)

From page 1

"It used to take at least one day to get to the county's hospital, but now we can receive equal treatment at the township health center," said Wu Yuanming, director of the Jiuzhuang township health center in the mountainous Guizhou.

At present, telemedicine services have covered all public medical institutions in Guizhou, and more than 2.4 million diagnoses have been made through telemedicine since June 2016, said the Guizhou Provincial Health Commission.

The Xi'an district of Mudanjiang city, Heilongjiang province, has built a "smart brain" system to provide farmers with information services on agricultural technology, financial services and product transactions. Meanwhile, the full coverage of monitoring equipment has also supported accurate pandemic prevention.

Digital Villages: New Way to Common Prosperity

Refinement of rural governance

Managing rural refuse and natural disasters is another benefit of digital technologies, which have been applied to promote the rule of law in rural areas, improve rural governance, and enhance self-governance by villagers.

According to data from the Ministry of Agriculture and Rural Affairs (MOA), information management and service platforms were established in 78 percent of the counties, and 77 percent of administrative villages were equipped with video monitoring systems, which can provide a cleaner and safer environment for villagers.

On the App, Guizhou Digital Village, you can see the operation of more than 120,000 garbage collection points and nearly 6,000 garbage collection vehicles, covering more than 110,000 villages in Guizhou.

By establishing the smart water conservation system, Guizhou's Xifeng county realized the real-time monitoring of 32 reservoirs and seven rivers to give early alert for floods.

Enterprises are joining in the process. The MOA has signed agreements with enterprises to promote the application of digital platforms and improve rural governance.

Cooperating with the Alibaba Group, Jiaoling county, Guangdong province, has developed a precise governance App based on "credits," which reflect the performance of both governments and villagers, therefore gradually standardizing complex or trivial affairs.

Water Security: Humanity's Common Link

Voice of the World

Edited by QI Liming

According to the United Nations University, Institute for Water, Environment and Health, the UN's first-ever assessment of water security in Africa has shown worrying signs.

Only 29 African countries have made some progress in water security, which includes a reliable supply of water, over the past three to five years, while twenty-five have made none.

Water security, a global concern

The UN's concept of water security encompasses various needs and conditions, namely water for drinking, economic activity, ecosystems, hazard resilience, governance, trans-boundary cooperation, financing, and political stability.

Water security, therefore, is not just about how much natural water a country has, but also how well the resource is managed. This issue concerns both the survival and development of one country or one continent, along with the common and shared destiny of mankind.

From March 21-26, the 9th World Water Forum was held in Dakar, Senegal. It was the first time the largest international water-related event was held in sub-Saharan Africa.

Themed "Water Security for Peace and Development," the forum focused on four priorities: water security and sanitation, cooperation, water for rural development, and means and tools for implementation of reforms in water and sanitation.

Additionally, the forum convened a summit among heads of state and major international institutions. In order to advance the political agenda on water and sanitation at the midpoint of the 2030 agenda, implementing the water and sanitation targets and Sustainable Development Goals (SDGs) is an urgent need.

(PHOTO: VCG)

China's actions on water security

March 22 this year was the 30th World Water Day, along with March 22-28 being the 35th China Water Week. The UN announced the theme of World Water Day of 2022 as "Groundwater: Making the Invisible Visible."

The theme of China's campaign commemorating World Water Day and China Water Week was "Promoting Integrated Governance of Groundwater Overdraft, Recovering Ecological Environment of Rivers and Lakes."

China's Ministry of Water Resources has launched a series of campaign activities in general. Among the activities, there are two that deserve special attention:

- Promoting integrated governance of groundwater overdraft, and rehabilitating the ecological environment of rivers and lakes
- Accelerating the construction of basins, and reinforcing the capacities of forecasting, early warning, previewing and emergency planning through digitalization

Remarks from scientists and officials

Grace Oluwasanya, a Nigerian water scientist and the lead author of the UN assessment report published in March, said that, "In the Central African Republic, by comparison [to the assessment], located in the region with the highest water availability per person on the continent, just 37 percent of people have basic drinking water services."

She said how water was managed in different countries was even more important than its availability, adding that, "When you add other conditions, for example the economy, resilience to hazards, and political stability into the mix, you realize having naturally existing water isn't the only thing you need to be water secure."

She also noted that in many countries, the impacts of climate change, ranging from worsening floods to harsher droughts and stronger storms, are making achieving water security even more difficult.

David Malpass, president of World Bank Group, speaking at the World Water Forum, said that water is essential for production, including for power generation, mining, industry and farming, which accounts for 23 percent of GDP in sub-Saharan Africa. With nine out of 10 climate events being water-related, better water management is critical for adaptation and resilience.

Addressing gaps in water-related data is an essential building block for improved water resource management. The World Bank Group recently launched the World Bank Water Data Portal. It consolidates curated water data into one place for the first time. "We are now collaborating with the World Meteorological Organization, through the Water and Climate Leaders Coalition, on a Global Water Information System to bring together data on water and climate," said Malpass.

Once the data is gathered, coordinated action is urgently needed on three fronts to address the water crisis. "Firstly, we focus on the policy measures and better institutions, then we need to increase public and private investment and finally, greater citizen participation is the most essential part," he said.

Opinion

Disruptive Technology Is Shaping the Future

By Rasha Khalil

Over the past two years, the breakthrough in sci-tech innovation has profoundly reshaped the way we live, communicate and work. Disruptive technology affects the normal operation of a market or an industry. The world has witnessed many disruptive technological revolutions changing the economy and reshaping lives, such as the birth of steam engines and the electrical grid. These technologies have caused waves of complementary innovations, leading to an increase in productivity.

Currently the world is entering the era of digital revolution which would have never happened if it wasn't for the Internet. The Internet itself was a disruptive innovation that has forced businesses to keep innovating to stay relevant in the market and during the current global events.

As one of the subsequent innovations of the Internet, the mobile Internet gives people tools to become potential innovators or entrepreneurs. For many people, work is where the Wi-Fi is. People who define themselves as digital nomads move around the world frequently, integrating and sampling other cultures. As the number of digital nomads increases, the percentage of value-adding jobs in their country of residence will increase. At the same time, they will support the economy in the host country through paying taxes and investing in the domestic market.

With the availability of the Internet, the Human Cloud has surged as the largest growing segment of the gig economy. Some of the jobs that white-collar workers in advanced rich countries used to do are now broken down into individual tasks advertised online and carried out by remote workers scattered all over the world.

This 50 billion USD industry is disruptive as it affects the workforce in developed and developing countries alike. This is because the workers in developed countries perceive the gig economy as having less opportunity and being more of a threat. While for the workers in developing countries, the gig economy helps in creating new opportunities and offers a way out of poverty.

Another similar example is happening in the self-driving vehicle industry. A decade ago, the notion of having self-driving vehicles was considered an impossible industrial task. But now, it is quite achievable, especially with the availability of the needed resources and the dramatic fall in production costs.

This emerging technology trend will considerably alter consumer behavior, which will severely disrupt the car sales industry. Personal consumers will shift from needing to purchase a car to requesting a service to satisfy the same economic need. And keep in mind that vehicles will be cheaper and more convenient in the long run, as they will include a service rather than just owning a car.

In addition, this can cause side effects in the oil industry and its adjacent industries due to the lower demand, and reflection on the wide range of jobs they provide. Car and manufacturing companies will be forced to adapt by switching their production to either hybrids or only electric cars. However, it is likely that some currently dominating car manufacturers will fail to adapt to such complex shifts and will be forced out of the market. At the same time, new car manufacturers might emerge throughout the transition.

The technology will cause a dramatic shift in labor and the workforce. Estimates of job losses could be in the millions, when adding up all the workers in the oil industry, car manufacturing, sales sector, parking service and drivers. However, this unemployment will be a structural one because the change will also lead to increased economic growth as new opportunities will arise with new emerging industries, and huge numbers of new jobs will be made available.

This upsurge in innovation will bring lasting change, both good and bad. And it is up to us to hunt for the right opportunities and shape the outcomes. Therefore, it is extremely significant to understand and detect the barriers to innovation in organizations, and to create the right business environment to improve the innovation success rate. Moreover, prospective disruptors should consider certain factors, including aiming at underserved markets and leveraging technology to meet the demands of underserved customer segments at lower cost.

Policymakers and societies need to prepare for future technology. They will need a clear understanding of how technology might shape the global economy and society over the coming decade to do this well. They will need to decide how to invest in new forms of education and infrastructure and foster innovation, because some of the most innovative ideas require the right opportunity and circumstances to demonstrate their value.

Professor Rasha Khalil has two doctoral degrees and professorships in management and law. Her research focuses on environmental law, natural and human resources management, communication, etc.

Hi! Tech

Universities Get Smart to Fight the Pandemic

By Staff Reporters

During the past two years, Chinese universities have joined in the country's scientific anti-pandemic mission, and developed efficient methods to provide strong support for containing the COVID-19 pandemic.

Disinfection robot

The intelligent disinfection robot developed by Shanghai University can replace human labor. One of these robots can spray more than 20kg of disinfectant within 15 mins. The robot can work continuously for 24 hours a day to serve key areas.

In the meanwhile, a robot developed by the Geely University of China can automatically create a canteen navigation map, using its laser radar and visual identity technology, so that it can complete the autonomous and continuous disinfection no matter whether the canteen is manned or unmanned.


Atomizing disinfection robot


The disinfection robot in Shanghai University


Tongji NCP-AIS


222-nm "light vaccine"

(PHOTO: SHANGHAI ASSOCIATION FOR SCIENCE & TECH)

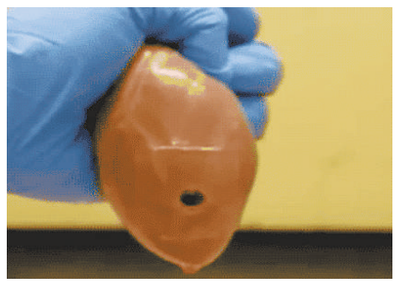
Tongji NCP-AIS

Tongji NCP-AIS, a system developed under the leadership of Tongji University, can detect the health conditions of human bodies. Using face recognition technology and in combination with field temperature detection, this system, deployed at the front gate of Tongji University, can automatically collect and analyze the personal information of the teachers, employees and students as they enter.

222-nm "light vaccine"

Fudan University's "light vaccine" can emit pure far-UVC light with a 222-nm wavelength, having a 99.9 percent germicidal effect on the novel coronavirus. The "light vaccine" was developed to protect people by creating an environment in which the viruses cannot transmit. After the novel coronavirus absorbs a lot of such radiation energy, its RNA helical chains will be destroyed, and become unable to replicate. In this way, the virus can be killed.

Magic Tape Stitches Wounds



When sticking the tape on the perforated heart of a pig, the bleeding can be stopped and the heartbeat was not affected. (PHOTO: SCREENSHOT)

By YU Haoyuan

In the near future, pasting protective tape may become an essential skill for surgeons.

A research team from the Massachusetts Institute of Technology (MIT) has recently developed a medical tape that can be used to stop bleeding in wounds, as well as replacing sutures to allow wounds to heal.

The tape is made with a nonadhesive and a bioadhesive layer by sticking them together with an adhesive. The adhesive is made from polyacrylic acid, an absorbent material found in diapers.

With such a design, the tape has strong adhesion and is completely water-resistance, which means it can be applied to wounds even if they are wet, something many medical adhesives cannot do.

Additionally, its excellent malleability can ensure it is stretched as required without falling off the wound. Therefore, it can withstand the forces of expansion and contraction of the skin and internal organs and causes little pain when sticking to wounds.

What is more astonishing is that it can even be used for internal wounds, an improvement on traditional stitches in all respects.

Researchers have experimented by sticking the tape on the perforated heart of a pig. The result showed that the bleeding stopped and the heartbeat was not affected.

The tape is expected to become a truly affordable product and may replace traditional wound closure methods in the future.

Adjuvants Help to Block COVID-19 Transmission

By ZHANG Jiaxing & QI Liming

In order to stop the infection and transmission of the Omicron variant, developing the COVID-19 vaccine is a top global priority. The great potential of vaccine adjuvants to stop the transmission of the virus is a focus of researchers.

What is an adjuvant? "Vaccine adjuvants can stabilize antigens and activate immunity simultaneously," said Zhang Yonghui, a principal investigator in the School of Pharmaceutical Sciences at Tsinghua University.

The solution of the commonly used COVID-19 inactivated vaccine is mainly composed of the effective antigen, the main component of the vaccine that can trigger an immune response. Moreover, there is an adjuvant system mainly composed of aluminum hydroxide or aluminum phosphate, which acts as an adsorption and immune booster.

Adjuvants actually work long before the vaccine being injected into the body. For example, through adsorption, it is possible to avoid antigen "hanging on the walls of the blood vessels" and ensure full dose injection.

(PHOTO: VCG)

China-Brazil Vaccine Cooperation, a World Model

My China Story

By FENG Jie & BI Weizi

Dimas Covas, a health expert and director of the Butantan Institute, Brazil, was bestowed with the 2021 Chinese Government Friendship Award by the Chinese government, making him the first Brazilian expert in the health field to receive this honor.

The team led by Covas worked collectively with Sinovac Biotech to promote the technology transfer of China's COVID-19 inactivated vaccine to Brazil, which demonstrated China's idea on promoting the COVID-19 vaccine as global public goods.

Confidence in CoronaVac

As a leading expert in the field of biotechnology, Covas has full confidence in the inactivated vaccine developed by China. At the beginning of the clinical trials, the Brazilian public had low trust in Chinese vaccines, and some politicians even discredited it.

Covas argued strongly that the Chinese COVID-19 vaccine is what Brazil needed, refuting the doubts against its reliability and efficacy. He said, "We must know that the Apple phone we use is made in China, that countless other industrial products are made in China, and that many international pharmaceutical companies have large-scale laboratories in China. Today, China is a hub of highly advanced technologies, which can meet the needs of any country in the world. There is no reason to misjudge or ignore the vaccine simply because it was initially developed in China."

With the pandemic impacting the whole world, global research institutions are joining the fight against the virus. The Butantan Institute, a medical research institute with a history of over 120 years, is also at the forefront. Covas believed that cooperation between two parties would help with final success against COVID-19.

Since June 2020, the Butantan Institute and Sinovac conducted several clinical studies, the most significant one of which was the Phase III clinical trial of CoronaVac, which was developed in April 2020 and was an adaptation to a previous vaccine used against SARS. In order to confirm the security and efficacy of the vaccine, more than 10,000 volunteers were involved in the trial.

Professor Dimas Covas. (COURTESY PHOTO)

"What is important for vaccine performance during a pandemic is to precisely prevent deaths and severe illnesses, and reduce hospitalization rates. CoronaVac, developed in China, performed very well in Brazil because it significantly reduced hospitalizations, especially among the elderly and health professionals, which shows that it is an extremely good vaccine," said Covas.

The power of international cooperation

Covas noted that the development of modern scientific and technological innovations cannot be achieved without the exchange and cooperation of different countries. "I have more than 30 years of experience in the research community. During that time, one of the hallmarks of my work was collaboration. We often need to work in teams and collaborate internationally. That is, in part, my responsibility as director of the Butantan Institute. And the reason I am where I am now is the result of the scientific and technical community seeking to collaborate, rather than compete. I think we should all learn from this unprecedented pandemic and become more acutely aware of the importance of collaboration," he said.

The first shipment of ready vaccines from China arrived in Brazil back in November 2020. More importantly, 600 liters of raw materials arrived in the same batch. To date, the Butantan Institute and Sinovac have provided more than 100 million doses of COVID-19 vaccine to Brazil, ensuring that half of the Brazilian population is vaccinated.

The cooperation between China and Brazil in terms of equitable distribution of vaccines serves as a model for the international community in the ongoing battle against the global pandemic.

This story is in cooperation with the International Talent Magazine published by Foreign Talent Research Center of MOST.

Letter to the Editor

Toward Quality-Education in China

By Asad Khalil

The development taking place around the world has led to changes of all concepts about classic teaching. The current era requires us to develop the teaching process in dynamic forms and methods. The concept of education has been renovated from a mere transfer of knowledge through indoctrination, into more advanced and complex tasks and operations aimed at achieving the comprehensive and integrated growth of the learners.

I have taught in five countries on three continents. Yet, teaching in China and working with Chinese colleagues is a unique experience for me. One can touch the thousands of years of Chinese civilization shortly after getting involved with Chinese society.

Chinese as groups or individuals, have unique characteristics that distinguish them from others in terms of the way they value education and educators. The relationship between teachers and students is based on the full appreciation of the role that teachers play in the development of society.

After working and teaching in China for more than a decade, I found that the Chinese recipe for learning is an inquisitive tongue, and a comprehending mind, which means through questioning and reasoning learners can acquire more knowledge. So Chinese learners take every opportunity to learn from their educators. As Confucius once said, "If I am walking with two people, there must be a teacher of mine amid them. I will pick out the good points of the one and imitate them, and the bad points of the other and correct them in myself."

I can think of many people over the long years I lived and worked in China, who impressed me with their talent and commitment in different ways. They range across a variety of ages, genders, and backgrounds. However, each one of those is special in one way or another. Sometimes, people couldn't do great things, but they did small things in a great way.

Professor Asad Khalil. (COURTESY PHOTO)

The effort made toward quality education in China has been witnessed in recent years through the improvement of the education system at all levels. This includes improving the education infrastructure of buildings, classrooms, laboratories and equipment, which are crucial elements of modern teaching.

Meanwhile, using technology in education has become a must in China as a response to national development, as well as becoming an instrument to face global challenges such as COVID-19. This development made education more relevant to the learners' digital life and helped them be prepared for their futures. Technology in China is renovating education, changing how, when and where students learn and helps students have access to diverse resources of knowledge beyond classroom walls, which inspires them to be critical thinkers and more dynamic problem solvers.

I believe the quality-oriented education in China is central to creating a bridge to a better future and to the Chinese dream, which is made of our individual dreams.

Professor Asad Khalil is a lawyer and Distinguished Professor at Southwest University of Political Science and Law, Chongqing.

Traditional Eastern Wisdom

Chime of Ancient Bells

By Staff Reporters

Music has always been a critical part of traditional Chinese culture, and when the Zenghouyi chime bells, which date back more than 2,400 years, were discovered in 1978 in Hubei province, they were recognized as one of the world's earliest and most extensive groups of ancient musical instruments.

Zenghouyi chime bells displayed at Hubei Provincial Museum. (PHOTO: VCG)

The Zenghouyi chime bells reflect the highest achievements of Chinese pre-Qin ritual and music civilization, as well as bronze casting technology. It has had a significant impact on a variety of fields, including archaeology, history, musicology, and the history of science and technology.

The complete set of chime bells consists of sixty-five pieces, suspended in three layers and eight groups from a curved foot-shaped, copper and wood clock frame.

Science and technology play a significant role in the creation of such an ancient cultural marvel. The creation of the bells requires knowledge of materials science, metallurgy, physics, mechanics, and acoustics, as well as core technologies such as lost wax casting and "double tone" characteristics.

With their exquisite decoration and precise temperament, the bells predate the European twelve equal temperament pianos by more than two thousand years and rewrite the history of world music.

What distinguishes the Zenghouyi chime bells is their enticing double tone characteristics. According to studies, the device's unique structure enabled it to produce distinct music. Controlling the exact tone of a bell before it has even been cast is extremely difficult. Precise ratios of copper, tin and any other additives to the bronze have to be regulated, and the dimensions of the mold have to be exact. It is an amazing feat.

Zenghouyi chime bells are not only tangible instruments for academic study, but they also still produce authentic sounds that are identical to those heard thousands of years ago.

Xi Plants Trees for 10th Year as Top Leader

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Forests and grasslands play a fundamental and strategic role in ecological security, Xi said, adding that thriving forests and grasslands are essential for a sound ecosystem.

At present, the ecological civilization in China has entered a critical period for eco-environment improvement, Xi said, calling for unswerving implementation of the new development philosophy and following the path of prioritizing ecological conservation and boosting green development.

The president called for efforts to coordinate the protection and systematic management of mountains, rivers, forests, farmlands, lakes, grasslands and sandy lands, advance scientific afforestation, increase the quantity and quality of forest and grass resources, and consolidate and enhance the carbon sink capacity of ecosystems.

In doing so, we will make greater contribution to global environmental and climate governance and to the modernization featuring harmonious coexistence between humanity and nature, Xi said.

Xi also urged more efforts to promote voluntary tree-planting activities, raise public awareness, and carry out such activities in a scientific, thrifty and pragmatic manner.

Source: XINHUA

ICV's Testing Speeds up

From page 1

Within the 60 square kilometers of BDA, 332 digital intelligent intersections have been built. A city-level engineering test platform for high-level autonomous driving vehicles has also been constructed. The Internet-connected and cloud-control system has been primarily established to offer external services. The number of all kinds of autonomous driving vehicles for normal tests has reached around 300.

Changsha, the capital city of Hunan province, was also selected to conduct pilot projects in the first batch. The city designed China's first customized intelligent bus line, reducing the traveling time by 13.3 percent on average. In addition, the bus line's optimization rate of being on schedule during rush hours reached 80 percent.

"Such achievements fully proved that the pilot projects are valuable and on the right track," said Yang Hongyi, an official from MOHURD. Apart from making further use of the pilot projects platforms, he said the development of the pilot projects should also be guided by the need of cities and their residents.

Yang hopes to use the experience gained from the pilot projects and set standards for all over the country.

Service Info

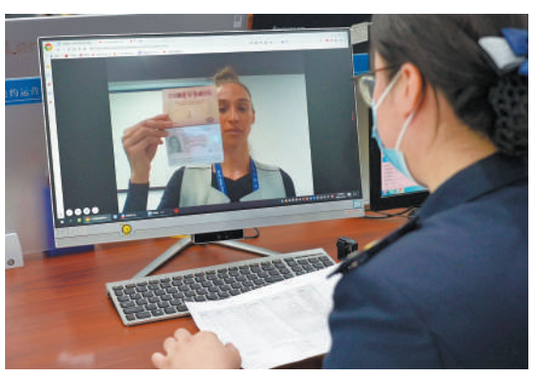
Expats Solve Income Tax Queries in Contactless Way

By LONG Yuemei & QIN Ruixuan

On March 30, Russian Anastasia Antropova, who works in Hengqin Chimelong, Zhuhai city, as a dancer, made a video call with the staff of the Hengqin Tax Department through the V-Tax platform, completed her identity confirmation, and obtained her registration code on the Individual Income Tax APP.

Due to the impact of COVID-19, Antropova lived in China for more than 183 days in 2021 and is required to complete her individual income tax settlement in accordance with Chinese tax law. Like her, about three hundred foreign employees in Hengqin Chimelong hold foreign passports and need real name authentication before registering and logging in to the Tax APP.

The tax department of Hengqin took the initiative to contact relevant companies to enquire about the situation of foreign employees. Four centralized processing periods were then specially arranged to solve any problems they may have. Through online processing, hundreds of foreign employees completed the real-name authentication without leaving home, conducive to more efficient completion of subsequent processing procedures.



Anastasia Antropova solves income tax queries in contactless way. (PHOTO: QIN RUIXUAN)

"As the construction of the Guangdong-Macao In-depth Cooperation Zone in Hengqin progresses, an increasing number of people from outside of Chinese Mainland are moving to Hengqin, a small island of Zhuhai city. Through research, we gain a better understanding of the management requirements of key industries, enterprises, and groups. We have developed appropriate plans for foreign nationals with special needs and established a 'non-contact' fast track for them to resolve individual income tax issues," said an official from the Cooperation Zone Tax Bureau.

To adapt to the measures taken for pandemic prevention and containment, the Hengqin tax department has taken the lead in realizing the "contactless" service for all businesses in the province, and all tax matters can be handled online with higher efficiency.