科技日報

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Science and Technology Daily

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International Cooperation

Global Talent Exchange: Sharing Wisdom, Promoting Innovation

By Staff Reporters

The Chinese government is striving to improve the level of global technological innovation and openness, and actively contribute Chinese wisdom to coping with global challenges. That's the message from Wang Zhigang, minister of science and technology, made during his speech at the opening ceremony of the 20th Conference on International Exchange of Professionals (CIEP), which launched on May 26 in south China's Shenzhen.

Co-organized by the Ministry of Science and Technology (State Administration of Foreign Experts Affairs) and Shenzhen Municipal People's Government, CIEP used the theme of "Accelerating the construction of talent centers and innovation hubs of global importance," at this year's conference, where it hosted organizations, institutions, companies and talent from around the world.

At present, China has established sci-tech cooperation with more than 160 countries and regions around the world, and participated in more than 200 international organizations and multilateral mechanisms, said Wang.

He added that the country has been actively participating in a series of international major scientific programs and projects such as ITER, GEO, SKA, and striving to promote international exchanges and cooperation in the fields of health, climate change, clean energy, artificial intelligence, biomedicine, and modern agriculture, contributing more Chinese technological solutions to solving global challenges.

China welcomes scientists and entrepreneurs across the globe to share opportunities of the country's open policy on innovation, and make more sci-tech contributions to promoting the building of a community with a shared future for mankind, said Wang. *See page 2*

Equipped with 6.2 megawatt typhoon-resistant wind power generating units, China's first deep-sea floating wind power equipment "Fuyao" was towed in Maoming, south China's Guangdong province on May 29. (PHOTO: XINHUA)

Editor's Pick

Science and Technology Daily Weekly Edition, which offers the latest sci-tech news and policies to experts at home and abroad, was displayed at the opening ceremony of the 20th Conference on International Exchange of Professionals. (PHOTO: Livestream screenshot)

BRICS to Collaborate on Industrial Digital Transformation

By Staff Reporters

The BRICS Forum on Development of the Industrial Internet and Digital Manufacturing was held from May 23 to 24 in Xiamen, east China's Fujian province, to promote cooperation in the fields of industrial Internet and digital transformation of manufacturing, as well as green development.

As the global industrial and supply chains have not fully recovered from the impact of COVID-19, industrial development encounters many uncertainties.

BRICS countries should seize the opportunity presented by industrial Internet development, strengthen the innovative applications of the industrial Internet, and accelerate the digital transformations and upgrading of enterprises, to inject new impetus into BRICS countries and the global economy, said Chinese State Councilor Wang Yong at the forum.

China is willing to work with other BRICS partners to promote the development of the industrial Internet and digital manufacturing, and jointly achieve growth that is higher quality, more resilient and sustainable, said Wang.

In China, digital transformation leads the way to industrial development with support of the world's largest optical-fiber and mobile networks. Meanwhile, China's industrial Internet sector's output has exceeded one trillion RMB (about 150.2 billion USD) with a host of new business models emerging, said Xiao Yaqing, minister of industry and information technology (MIIT).

Xiao said that MIIT will work with industrial authorities of BRICS countries to establish an industrial cooperation network, promote free flow of funds, goods, personnel, technology and services, and form stable industrial and supply chains.

An initiative on cooperation among BRICS countries in the manufacturing industry's digital transformation was launched on May 23, where consensus was achieved on issues such as the development of digital infrastructure, the digital transformation of manufacturing, and the inclusive growth of small and medium-sized enterprises.

Ocean Satellite Constellation: 20 Years of Progress

By LU Zijian

It has been 20 years since China's first ocean observation satellite Haiyang (HY)-1A was launched on May 15, 2002.

In fact, the research of ocean satellites in China can be traced back to 1986, said Lin Mingsen, director of National Satellite Ocean Application Service (NSOAS), who was among the first scientists to engage in the research work and tackle the conundrum of microwave scatterometer sea surface winds remote sensing in 1995.

It was not until 1997 that the HY-1 series satellite project was approved. As the deputy chief designer of HY-1 series ground application system, Lin continued his research work with perseverance. Thanks to Lin and his team's hard work, China finally had its own ocean satellite.

Trail blazing marine monitoring

Since then the country has fast tracked ocean satellite development. HY-2A, China's first marine dynamic environment satellite was sent into space in 2011. Ten years later, HY-2D was launched successfully. Together with HY-2B and HY-2C, China established its first marine dynamic environment network, which requires only six hours to monitor 80 percent of the global ocean, the world class level.

The HY-2 series satellites also work in tandem with in orbit HY-1 series satellites, to combine marine dynamic environment monitoring with marine resource exploration.

In April this year, the Gaofen-3 03 satellite successfully networked with the orbiting Gaofen-3 01 and Gaofen-3 02 satellites, marking the formation of China's first land-sea radar satellite constellation.

The networked HY-1 series, HY-2 series, and Gaofen-3 series satellites further improved the country's multi-dimensional marine monitoring system.

Practical application

"The ocean satellites of our country have evolved from a single model to multiple ones, and from being used for test application to operation service," said Lin.

In fact, ocean satellites data has been adopted in a broader and deeper sense, such as China's polar scientific expeditions, where it plays an important role. During the country's 11th scientific expedition to the Arctic in 2020, a customized satellite observation plan was made for the research icebreaker Xuelong 2. The accurate and timely data from the ocean satellites provided information guarantees for submerged buoy retrieval and safe operation on ice stations.

The ocean satellite data was also used for disaster prevention and control. In September 2018, the super destructive Typhoon Mangkhut hit the southern part of China. HY-2A provided the latest data regarding the wind field, playing a key role in predicting the route of the typhoon.

In the summer of 2020, the Poyang Lake area in east China's Jiangxi province suffered from floods. HY-1C, HY-1D and Gaofen-3 satellites sent back high-quality images and data, helping the decision making for post-flood reconstruction.

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Harvesting Energy from the Universe

By WANG Xiaoxia

Chinese scientists have invented a new material that can continuously harvest and utilize energy from the sun and outer space 24/7, which is expected to help tackle climate change and support space missions. The study was published in journal *Proceedings of the National Academy of Sciences* (PNAS).

The sun and outer space are the ultimate heat source and the heat sink of Earth's energy cycle. However, photothermal (PT) for energy harvesting from the sun and radiative cooling (RC) for releasing energy to outer space, are almost achieved independently by using absorbers and emitters.

With the coating material based on vanadium dioxide (VO_2), the research team, led by Prof. Pei Gang and Prof. Zou Chongwen from the University of Science and Technology of China, proposed a spectral adaptive regulation mechanism that integrated the PT in daytime and RC during nighttime within a single device.

The spectrally self-adaptive absorber/emitter (SSA/E) can be heated to nearly 170 °C above ambient temperature under sunshine and cooled to 20 °C below ambient temperature at night.

The SSA/E continuously operates without break or energy consumption, which greatly improves the capture and utilization efficiency of solar thermal energy and cold energy from outer space.

According to the researchers, this material has broad application scenarios as heating and cooling are two kinds of significant end uses of thermal energy in society. Therefore, it has considerable potential for global energy conservation, greenhouse emission reduction, as well as carbon neutrality.

Improving Wildlife Protection for Mega-biodiversity

By TANG Zhexiao

An updated national biodiversity database released on May 22 has shown 10,343 species newly added in the 2022 edition, according to the Chinese Academy of Sciences (CAS).

The database, named the *Catalogue of Life China 2022 Annual Checklist*, brings the total number of species to 138,293, including 68,172 animal species, 46,725 plant species, and 17,173 fungi species, among others.

China is the only country that publishes the biological species checklist every year, according to CAS's Biodiversity Committee. The database has supported biodiversity scientific research, conservation and policy-making.

As one of 17 mega- biodiversity countries in the world, China harbors nearly 10 percent of all plant species and 14 percent of animals species on the Earth, according to the UN Development Program.

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WEEKLY REVIEW

Shenzhou-14 Prepared for Launch

The combination of the Shenzhou-14 crewed spaceship and a Long March-2F carrier rocket had been transferred to the launching area, according to the China Manned Space Agency (CMSA) on May 29. The facilities and equipment are in good condition, and various pre-launch function checks and tests will be carried out as planned, said CMSA.

More Than Half Tree Planting Plan Achieved

By late May, there had been 29.85 million mu (1 mu equals 666.7 m^2) of forest built in 2022, covering 57.6 percent of this year's planting plan, said the National Forestry and Grassland Administration at a press conference on May 27.

World Record for Floating Airship Atmosphere Observation

Jimu No.1, China's self-developed floating airship designed for atmosphere observation, reached an altitude of 9,050 meters during the recent observations, another new world record. The floating airship will provide vital data on the water source of Qinghai-Tibet Plateau, and contribute to climate change response.

Lifting Platform Set at JUNO

A lifting platform was recently installed at the Jiangmen Underground Neutrino Observatory (JUNO) for the setup of the organic glass ball, a component of the neutrino detector at JUNO, which is one of three major neutrino experiments in the world.

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