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WEEKLY EDITION

China's Lunar Exploration Enters Phase-4: International Lunar Research Station Built by 2035

By Staff Reporters

Approved at the end of 2021, the fourth phase of China's lunar exploration program included launching Chang'e-6, Chang'e-7 and Chang'e-8 missions by 2030, according to Wu Weiren, chief designer of China's lunar exploration program.

Phase-4 missions are planned to land on the south pole of the moon, after which a basic lunar research station will be established. "This is the main goal of the entire Phase-4 missions," said Wu.

The three missions have their own tasks. Chang'e-6 is expected to collect lunar samples and return them to the Earth, whereas Chang'e-7 plans to conduct field reconnaissance for water ice, climate and landform. Scientists hope that water ice can be detected on the lunar south pole, which is another crucial aim of the missions. On the other hand, Chang'e-8 is to determine how to make use of the resources on the south pole of the moon. Wu said that all the exploration

will lay a foundation for long-term work on the moon in the future.

On the lunar south pole, there are deep craters in which there could be water. The water could exist in the form of water ice, as the craters are not exposed to sunlight being located at a depth of 10 kilometers. "If water can be found, I think the research station at the lunar south pole could be run for a long time," said Wu.

Preparing for the construction of the International Lunar Research Station (ILRS) is also to be carried out, starting with the basic research station. According to Wu, China aims to complete construction of the ILRS by 2035. He also assumes that there could be coordinated operations of multiple rovers, landers and small flying equipment on the surface of the moon under the command of a control center.

Many countries and international organizations have demonstrated their willingness to be involved in the ILRS, said Wu, adding that the ILRS hopes to act as a transfer in the foreseeable future.



The "Deep Sea No.1" energy station at the Lingshui 17-2 gas field off south China's island province of Hainan. (PHOTO: XINHUA)

Editor's Pick

Exploring Energy Supplies and Secrets Far Beneath the Sea

By LU Zijian

The natural gas generated by Deep Sea No.1, China's first self-operated, 1500-meter, ultra-deep-water gas field, reached more than one billion cubic meters recently after the gas field was put into operation last June. Despite being a late comer in exploration for petroleum and natural gas in deep water, China has managed a quick catch up.

Deep water drilling and exploration

The deep water zone usually refers to water deeper than 300m, and ultra-deep water zone deeper than 1500m. More than 70 percent of the global petroleum and natural gas reserves lie under the sea, and around 40 percent of the reserves are in deep water, which makes deep water drilling and exploration extremely important.

Located 150km to the southeast of Sanya, Hainan province, Deep Sea No.1 is expected to hold an energy reserve of more than 100 billion cubic meters. However, because the gas field is in such

deep water, the process of exploration and extraction faces many challenges.

Deep Sea No.1 is also the world's first 100,000-ton class deep water semi-submersible platform for producing and storing petroleum and natural gas. With self-developed technologies for the past 20 years, China overcame three major technical problems, namely deep water, high temperature and high pressure in petroleum and natural gas exploration.

Now, it takes only one day for the natural gas to be extracted from the 1500m-deep water and sent to households, and the gas field is able to deliver three billion cubic meters of natural gas per year to south China's Guangdong and Hainan provinces and Hong Kong.

With its system of technologies for such exploration, China has now become one of the few countries that are able to independently explore petroleum and natural gas in deep water.

Deep-sea diving

Apart from extracting fossil fuels from the sea, people also go deeper to

explore the mysteries of the Earth, since oceans deeper than 2,000 meters cover 60 percent of the planet. It was through manned deep diving that China discovered polymetallic nodules on the seamount, the ancient hydrothermal district and cold water coral forests in the South China Sea.

In 1986, the country's first manned submersible was developed, only able to dive to a depth of 300 meters. More than 20 years later, the self-designed Jiaolong came into being in 2012, successfully diving as deep as 7,062 meters.

On November 10, 2020, the domestically-developed Fendouzhe dived in the Mariana Trench in the Western Pacific, reaching 10,909 meters, setting a new record for China's manned deep-sea diving. This means that China leads the world in the field of large-depth manned deep-sea diving.

The country has also had much progress in unmanned submersibles for deep-sea diving.

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Optimum Astro-observation Base Built on Qinghai-Tibet Plateau

By Staff Reporters

Nine optical astronomical telescope projects, with a total investment of nearly 2 billion RMB, have been settled in the Qinghai Lenghu astronomical observation base.

The base, located on Saishiteng Mountain, near Lenghu Town in Qinghai province, has proved to be a quality astronomical observatory site after three years of monitoring and testing by researchers from the National Astronomical Observatories of the Chinese Academy of Sciences (NAOC).

According to the research result published in the journal *Nature* in August 2021, the area of over 100,000 sq kms, with an extremely arid climate, unusually clear local sky (day and night) and very stable local surface air, could become one of the world's best observatory sites, as good as the existing sites in Hawaii and Chile.

In recent years, a number of astronomical telescope projects have been established in Lenghu area, said Tian Cairang, executive deputy director of the Lenghu Industrial Park Management Committee. See page 4

More COVID-19 Antigen Self-test Kits Approved

By Staff Reporters

The National Medical Products Administration (NMPA) of China approved 17 varieties of COVID-19 antigen self-test kits by March 18, enabling those who need to test to do so in just 15 minutes.

Antigen tests detect the novel coronavirus by identifying the protein shell. The antibody on the test paper sets out to look for the shell and reveals the virus after combining specificity. The nucleic acid test, on the other hand, breaks the virus, extracts the nucleic acid and conducts amplification, which takes more time.

Comparing the two test methods, the antigen test can be widely applied and is easy to conduct with high efficiency and low cost, which could greatly ease the burden of medical staff and institutions, said Huang Ailong, professor at Chongqing Medical University.

Not requiring any medical instrument or facility, antigen tests can be conducted by a single person at home, providing maximum convenience. In addition, home testing can also prevent

people from cross infection when they gather to queue up for nucleic acid tests.

Convenient as it is, the antigen test shows a lower accuracy rate than nucleic acid tests, which is still needed to confirm the diagnosis of COVID-19, according to the National Health Commission. However, antigen tests can still be used to detect COVID-19 in most patients when there is a heavy concentration of the virus.

Antigen tests can therefore be used as a supplementary approach for the detection of the virus, especially when the pandemic is spreading swiftly over a short period of time. With the fast and convenient antigen test, less transmission can be realized with early detection of the infected.

Jilin province, which has recently been hit by a large wave of infections, distributed millions of antigen self-test kits to its residents, aiming to accelerate large scale screening.

The antigen self-test kits can be purchased both online and offline (see concerned article on page 4).



A staff at Zhongda Hospital Southeast University is taking the COVID-19 antigen test. (PHOTO: XINHUA)

International Cooperation

RCEP Effective in Malaysia

By Staff Reporters

The Regional Comprehensive Economic Partnership (RCEP), the world's largest free trade agreement, came into effect in Malaysia on March 18. Within ASEAN, Malaysia is expected to be the largest beneficiary of the agreement in terms of exports, with a projected 200 million USD increase, according to Malaysia's Ministry of International Trade and Industry (MITI). Meanwhile, China-Malaysia economic relations will be greatly promoted.

According to the agreement, 67.9 percent of Malaysian goods receive instant zero tariff when exported to China whereas 69.9 percent vice versa. Both countries added new market entry promises on the basis of China-ASEAN free

trade zone, such as mechanical equipment and parts from China to Malaysia, and chemical and paper products from Malaysia to China.

Based on data from the MITI, China has remained Malaysia's largest trading partner for 13 consecutive years, and the trade volume between the two countries accounted for 18.9 percent of Malaysia's total trade volume in 2021, increasing by 20.7 percent compared with that of 2020.

The MITI said that RCEP represents a significant milestone in the vibrant growth and revitalization of economies, adding that "RCEP would spark the creation of new regional supply chains apart from strengthening existing networks, thereby boosting the growth of domestic businesses as they immerse in to the global trading ecosystem."

RCEP has 15 members, including 10 ASEAN members and five free trade partners of ASEAN, namely China, Japan, South Korea, Australia and New Zealand, composing about one third of global GDP and population. The agreement has come into effect in 12 member states.

The agreement includes tariff reduction and exemption, trade convenience, service investment and intellectual property rights protection, and more than 90 percent of goods within the partnership will realize zero tariff gradually.

Taking effect on January 1, RCEP has already demonstrated its positive influence on trade within the partnership. Based on China's customs data, the total volume of import and export of China with RCEP partners reached 1.85 trillion RMB, increasing 9.5 percent year-on-year.

WEEKLY REVIEW

Guidelines Released to Strengthen Governance over Sci-tech Ethics

Ethics should be emphasized throughout the process of scientific research and technological development, according to the guidelines issued by the General Office of the Communist Party of China Central Committee and the General Office of the State Council recently.

Second Space Class Delivered from China's Space Station

The second lecture from China's Tiangong space station was delivered on March 23, according to the China Manned Space Agency. The lecture, consists of diverse experiments, was given by the Shenzhou-13 astronauts Zhai Zhigang, Wang Yaping and Ye Guangfu.

Yaogan-34 02 Remote Sensing Satellite Launched

A new remote sensing satellite of the Yaogan-34 series was sent into space from the Jiuquan Satellite Launch Center at 3:09 pm (BT) on March 17. It will be used for the survey of land resources, urban planning, crop yield estimation, and disaster prevention and reduction.

Diverse Dinosaur Fauna Confirmed in Northeast China

Chinese and international scientists confirmed on March 16 the discovery of a diverse fauna that contains at least five dinosaur species more than 100 million years ago in Fuxin, northeast China's Liaoning. The finding was published in the journal *Cretaceous Research*.

WECHAT ACCOUNT E-PAPER

