

China, Brazil make progress on 7th satellite

Long-term collaboration offers benefits of space technology to developing world

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Spacecraft designers and engineers from China and Brazil are working to develop a remote-sensing satellite that will obtain data and images for public services and economic development.

The CBERS-6 is under research and development at the China Academy of Space Technology in Beijing and Brazil's National Institute for Space Research in Sao Paulo, and will become the seventh satellite of the China-Brazil Earth Resources Satellite program.

According to the China National Space Administration, the 800-kilogram satellite will use a Brazilian structure and will be equipped with Chinese microwave imaging instruments such as an X-band synthetic aperture radar.

It is scheduled to be launched around 2028 by a Chinese Long March 2C or 2D carrier rocket from the Taiyuan Satellite Launch Center in North China's Shanxi province, and will work in a sun-synchronous orbit, the administration said.

Chinese President Xi Jinping has called the CBERS program a good example for high-technology and space cooperation among developing countries.

Researchers from both space bodies have held several meetings to discuss technical issues and have reached agreements on major arrangements. Meanwhile, the two sides have begun to work on the conceptual design for the CBERS-5, which will be followed by the CBERS-6, it noted.

The basis for space cooperation between China and Brazil was established in May 1984, when both countries signed a complementary agreement to the cooperation framework agreement on science and technology.

Four years later, they commenced their cooperation in the

satellite field by signing a protocol establishing the joint research and production of the China-Brazil Earth Resources Satellites.

After several years of painstaking work, CBERS-1, the first satellite created by the joint endeavor, was launched in October 1999. The second and third satellites — CBERS-2 and CBERS-2B — were launched in October 2003 and September 2007.

All of the first three satellites have been retired.

The fourth, CBERS-3, was lifted in December 2013 but failed to enter its preset orbit due to rocket malfunctions.

The fifth satellite, CBERS-4, which was launched in December 2014, and the most recent in this fleet, CBERS-4A, which was deployed in December 2019, are still operating.

All six CBERS satellites were launched by Chinese rockets from the Taiyuan Satellite Launch Center.

The CBERS program has generated and distributed millions of images to users in China and Brazil. Data products made by the program have served a wide range of public services in the two countries, including land resources surveys, environmental inspections, climate change research, disaster prevention and agricultural forecasts.

Rafael Lopes Costa, a Brazilian space engineer in the CBERS-4A program, said the satellite and its predecessors have enabled his country to be more independent on remote sensing data, adding that products generated by CBERS satellites "are very important for monitoring our large national area and environmental preservation and other applications".

The two nations have also offered a large amount of CBERS images to other developing countries and regions to help with their socioeconomic development.

New Long March series rockets to debut soon

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China Aerospace Science and Technology Corp, the country's dominant space contractor, plans to conduct the maiden flights of two carrier rocket models in the coming weeks.

Ma Tao, deputy head of spacecraft operations at the State-owned conglomerate, said that the Long March 8A's debut flight is scheduled to take place in January at the new Hainan International Commercial Aerospace Launch Center in Wenchang, Hainan province.

Officials were less specific about when the Long March 12 will make its first launch, but it will occur at the same spaceport in the near future.

The rockets' maiden flights will mark the beginning of operations at the new launch complex, he noted.

"The Long March 8A is a new variant in the Long March 8 series and will mainly be used to launch satellites for massive networks in low orbits. The Long March 12 is the first Chinese rocket with a diameter of 3.8 meters and will become the mightiest single-body rocket in the country," Ma said.

According to the China Academy of Launch Vehicle Technology, a CASC subsidiary in Beijing, the Long March 8A can use two types of payload fairing — a diameter of 4.2 meters and of 5.2 meters — and is able to transport spacecraft with a combined weight of 7 metric tons to a typical sun-synchronous orbit with an altitude of 700 kilometers.

It is capable, reliable and easy to prepare for launch, and its operation and procurement costs are relatively low compared with other rockets, it said.

The Shanghai Academy of Spaceflight Technology, also a CASC subsidiary and developer of the Long March 12, said the rocket model is more than 60 meters tall and is

capable of sending at least 12 tons of payloads to a low-Earth orbit or 6 tons to a sun-synchronous orbit about 700 kilometers above Earth.

The Long March 12 incorporates a number of new technologies and has multiple functions. Its service will extensively improve China's capability to send spacecraft to a sun-synchronous orbit and deploy multi-satellite networks in low orbits, according to the Shanghai academy.

In addition to the two mid-size models, CASC is also showcasing two larger types of rockets, the Long March 9 and Long March 10A, both of which are under research and development at the China Academy of Launch Vehicle Technology.

The baseline configuration of the Long March 9 will have three stages and a height of about 110 meters.

It will be powerful enough to transport spaceships weighing up to 50 tons to an Earth-moon transfer trajectory for lunar missions, including the construction of a large-scale science outpost, or at least 100 tons to a low-Earth orbit.

In addition to the baseline configuration, another model will have two stages and will be reusable, according to the Beijing academy.

The Long March 10A will be nearly 70 meters tall and 5 meters wide and will also have two configurations — one for crewed flights and the other for cargo missions. Its first core stage will be reusable.

All four rocket models were displayed at the 15th China International Aviation and Aerospace Exhibition, which concluded on Sunday in Zhuhai, Guangdong province.

The Hainan International Commercial Aerospace Launch Center is China's first launch complex dedicated to servicing commercial space operations. Other spaceports are directly administered by the government, mainly tasked with servicing State-funded programs.



The CBERS-4A satellite jointly developed by the China Academy of Space Technology in Beijing and Brazil's National Institute for Space Research in Sao Paulo is launched by a Chinese Long March carrier rocket from the Taiyuan Satellite Launch Center in Shanxi province on Dec 20, 2019. ZHENG TAOTAO / XINHUA