The surprising scale of China's space program

January 11 2018, by Matt Williams

The first Long March 5 rocket being rolled out for launch at Wenchang in late October 2016. Credit: Su Dong/China Daily

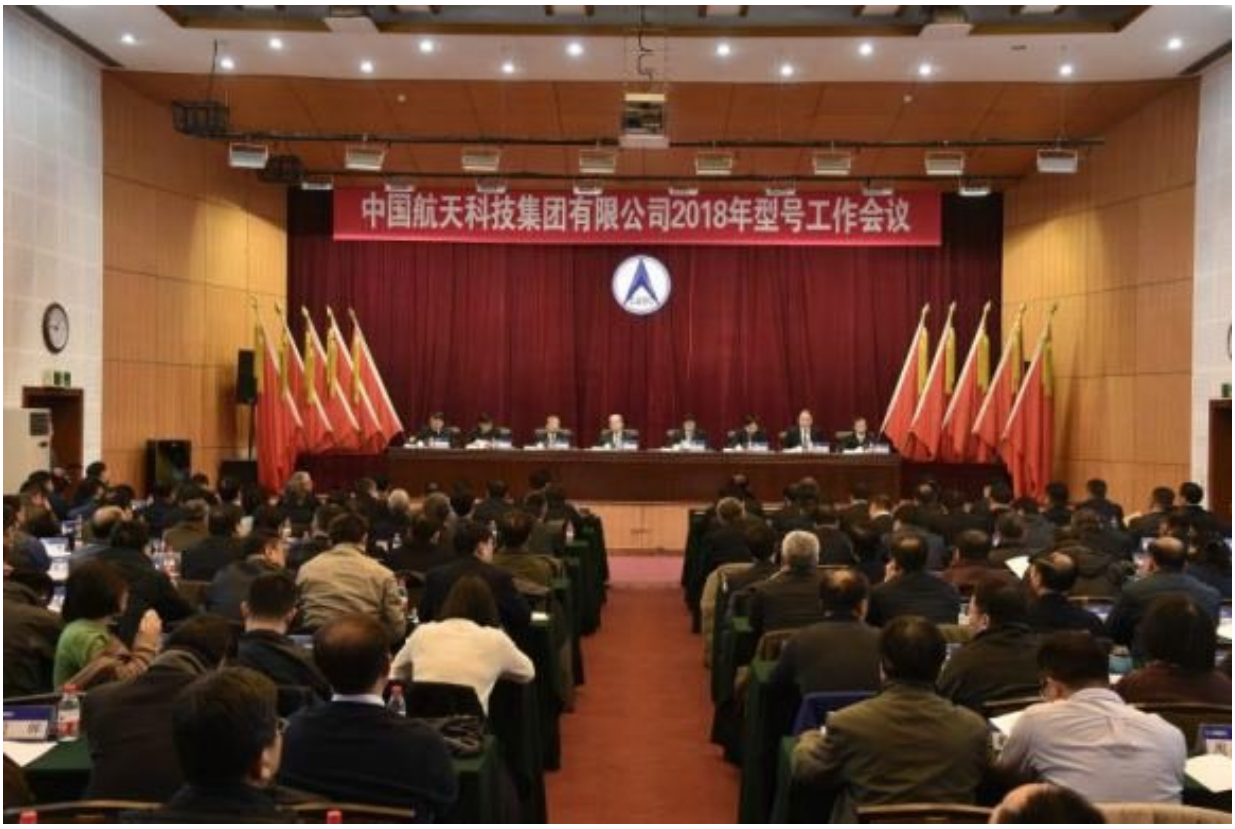
It's no secret that China's growth in the past few decades has been reflected in space. In addition to the country's growing economic power and international influence, it has also made some very impressive strides in terms of its space program. This includes the development of

the Long March rocket family, the deployment of their first space station, and the Chinese Lunar Exploration Program (CLEP) – aka. the Chang'e program.

Given all that, one would not be surprised to learn that China has some big plans for 2018. But as the China Aerospace Science and Technology Corporation (CASC) announced last Tuesday (on January 2nd, 2018), they intend to double the number of launches they conducted in 2017. In total, the CASC plans to mount over 40 launches, which will include the Long March 5 returning to flight, the Chang'e 4 mission, and the deployment of multiple satellites.

In 2017, China hoped to conduct around 30 launches, which would consist of the launch of a new Tianzhoui-1 cargo craft to the Tiangong-2 space lab and the deployment of the Chang'e 5 lunar sample return mission. However, the latter mission was postponed after the Long March 5 rocket that would have carried it to space failed during launch. As such, the Chang'e 5 mission is now expected to launch next year.

That failed launch also pushed back the next flight of Long March 5, which had conducted its maiden flight in November of 2016. In the end, China closed the year with 18 launches, which was four less than the national record it set in 2016 – 22 launches. It also came in third behind the United States with 29 launches (all of which were successful) and Russia's 20 launches (19 of which were successful).



China Aerospace Science and Technology Corporation (CASC) conference that took place on Jan. 2nd, 2018. Credit: spacechina.com

Looking to not be left behind again, the CASC hopes to mount 35 launches in 2018. Meanwhile, the China Aerospace Science Industry Corporation (CASIC) – a defense contractor, missile maker and sister company of CASC – will carry out a number of missions through its subsidiary, ExPace. These will include four Kuaizhou-1A rocket launches in one week and the maiden flight of the larger Kuaizhou-11 rocket.

In addition, Landspace Technology – a Beijing-based private aerospace company – is also expected to debut its LandSpace-1 rocket this year. In January of 2017, Landspace signed a contract with Denmark-based

satellite manufacturer GOMspace to become the first Chinese company to develop its own commercial rockets that would provide services to the international marketplace.

But of course, the highlights of this year's launches will be the Long March 5's return to service, and the launch of the Chang'e 4 mission. Unlike the previous Chang'e missions, Chang'e 4 will be China's first attempt to mount a lunar mission that involves a soft landing. The mission will consist of a relay orbiter, a lander and a rover, the primary purpose of which will be to explore the geology of the South Pole-Aitken Basin.

For decades, this basin has been a source of fascination for scientists; and in recent years, multiple missions have confirmed the existence of water ice in the region. Determining the extent of the water ice is one of the main focuses of the rover mission component. However, the lander will also to be equipped with an aluminum case filled with insects and plants that will test the effects of lunar gravity on terrestrial organisms.

China’s Chang’e 4 mission will land on the far side of the Moon and conduct studies on the South Pole-Aitken Basin. Credit: NASA Goddard

These studies will play a key role in China's long-term plans to mount crewed missions to the Moon, and the possible construction of a lunar outpost. In recent years, China has indicated that it may be working with the European Space Agency to create this outpost, which the ESA has described as an "international Moon village" that will be the spiritual successor to the ISS.

The proposed launch of the Long March 5 is also expected to be a major event. As China's largest and most powerful launch vehicle, this rocket will be responsible for launching heavy satellites, modules of the future Chinese space station, and eventual interplanetary missions. These include crewed missions to Mars, which China hopes to mount between the 2040s and 2060s.

According to the GB times, no details about the Long March 5's return to flight mission were revealed, but there have apparently been indications that it will involve the large Dongfanghong-5 (DFH-5) satellite bus. In addition, no mentions have been made of when the Long March 5B will begin conducting missions to low Earth orbit (LEO), though this remains a possibility for either 2018 or 2019.

Other expected missions of note include the deployment of more than 10 Beidou GNSS satellites – which are basically the Chinese version of GPS satellites – to medium Earth orbits (MEOs). A number of other satellites will be sent into orbit, ranging from Earth and ocean observation to weather and telecommunications satellites. All in all, 2018

will be a very busy year for the Chinese space program!

The second flight of the Long March 5 lifting off from Wenchang on July 2nd, 2017. Credit: CNS

One of the hallmarks of the modern space age is the way in which emerging powers are taking part like never before. This of course includes China, whose presence in space has mirrored their rise in terms of global affairs. At the same time, the Indian Space Research Organization (IRSO), the European Space Agency, JAXA, the Canadian Space Agency, the South African Space Agency, and many others have been making their presence felt as well.

In short, space exploration is no longer the province of two major superpowers. And in the future, when crewed interplanetary missions and (fingers crossed!) the creation of colonies on other planets becomes

a reality, it will likely entail a huge degree of international cooperation and public-private partnerships.

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