China’s Space Program Makes Its Mark

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China’s growing technological prowess is on clear demonstration not only across telecommunication markets around the globe, but high up above it, in space.

China’s space program overseen by the China National Space Administration (CNSA) has this year made several landmark accomplishments.

It began the construction of its own space station. Called Tiangong, the first of several modules (Tianhe) was launched in April with a successful supply mission launched and then docked to it the following month.

In the coming months, crewed flights and additional supply missions to the Tianhe module will be launched with additional modules to enlarge the station following next year.

China is the third nation to place in orbit its own space station, following Russia and the United States.

Tiangong joins in orbit the International Space Station (ISS), a joint project between the US, Russia, the European Space Agency (ESA) and Japan Aerospace Exploration Agency (JAXA). While the ISS hosts visitors from nations all around the globe, the US has specifically banned certain nations including China from sending participants.

Increased tensions between the US and Russia has put in question not only the future of the ISS itself but future cooperation between these two established space powers in general, with the latter of the two opting for greater cooperation with China regarding both Tiangong as well as planned projects around and on the Moon.

Also in May 2021, China marked the successful landing of its Zurong rover on the surface of Mars. Part of the Tianwen-1 interplanetary mission launched in 2020, China has become only the second nation ever to successfully land and operate a rover on the surface of Mars.

This follows a similar and also successful Lunar program featuring CNSA’s Chang’e spacecraft series. Lunar orbiters, landers and rovers helped China hone the skills required

for similar exploration on Mars. The program culminated in the Chang'e 5 mission to Earth's moon in 2020 where CNSA landed, collected samples from the Moon's surface and returned them to Earth.

China's increasingly sophisticated space program reflects China's ascend as a great nation. Its rapid progress, allowing it to circumvent restrictions and exclusion placed on it by the US amidst supposedly "international" efforts in space allow it to create alternative and truly international initiatives of its own, its new space station being among such initiatives.

Politically, China's progress has created apprehension in the West and in the United States in particular.

Fuelled by official accusations by the US government at its highest levels of China "stealing intellectual property" from the US, the Western media has tried to entertain the idea that China's growing list of accomplishments in space are owed almost entirely to "stolen technology" from the US.

Similar accusations were levelled against the Soviet Union and then Russia regarding its own achievements in space. At several junctures these accusations were laid bare as baseless when US "superiority" fell short. Russia's ferrying of US astronauts to space for over a decade after the retirement of the US space shuttle fleet is a prime example of America's chest-beating versus the reality that other nations can and do exist as peer competitors who can and do meet or surpass US capabilities and achievements.

China's advances in space and in other technology-intensive fields is owed to a much easier explanation rooted in a well-founded reality. China's population is several times that of the US and each year millions more students in China graduate with science, technology, engineering and mathematics (STEM) degrees than in the US.

Forbes in a 2017 article titled, "The Countries With The Most STEM Graduates [Infographic]," would note that:

> *Since the turn of the century, China has experienced a revolution in third level education. It has outstripped both the United States and Europe in graduate numbers and as of 2016, it was building the equivalent of nearly one university per week. That progress has caused a massive shift in the world's population of graduates, a population the US used to dominate. Last year, India had the most graduates of any country worldwide with 78.0 million while China followed close behind with 77.7 million. The US is now in third place with 67.4 million graduates, and the gap behind the top two countries is widening.*

The article also explains that:

> *STEM graduates have become a vital cog in the wheel of global prosperity and unsurprisingly, China is leading the way. The World Economic Forum reported that China had 4.7 million recent STEM graduates in 2016. India, another academic powerhouse, had 2.6 million new STEM graduates last year while the US had 568,000.*

These students are then absorbed into China's expanding research and development pursuits as well as China's massive industrial base, driving the sort of innovation required for China's burgeoning space program.

This talent isn't just being funneled into China's national space program but also into its parallel private space industry.

MIT's Technology Review in a January 2021 article titled, "China's surging private space industry is out to challenge the US," would note that China's private space industry has already designed, built and launched rockets (with payloads) into space.

The article also notes that the global space industry could be worth trillions by the end of the decade and that China's state and private space industry is positioning themselves to take advantage of that opportunity.

China's government is encouraging its private space industry alongside well-established state-owned enterprises like the China Aerospace Science and Industry Corporation (CASIC) and the China Aerospace Science and Technology Corporation (CASC) to help expand available aerospace-related human resources, to create competition and encourage fast-paced innovation poorly suited for its larger, more conservative state-owned enterprises.

Over the past half year China has proved itself as a capable spacefaring nation. Bolstered by a vast sea of human resources trained in STEM fields, a growing private space industry to augment its already capable state-owned aerospace enterprises, China is indeed poised not only for further national achievements, but also for top-tier competition in the growing global aerospace industry.

Nations like the US and Russia who have previously dominated access to space will have to formulate their own strategies with this in mind. The US has chosen an increasingly belligerent and unyielding approach toward China, seeking to strangle Chinese innovation and cut it off from global markets.

Russia has chosen to cultivate an increasingly cooperative and constructive relationship with Chinese aerospace. With the numbers clearly on China's side, Russia appears to have chosen wisely. America, on the other hand and for the time being, appears to have picked another fight it cannot and will not win.

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