
China's Military Space Capabilities and Its Implications for India

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Abstract

China's rapid advancements in space-based capabilities from surveillance and communications to navigation and earth observation, are just not competing against but are also challenging the American supremacy in outer space. With a strong military dimension to its space programme, China aims to make itself combat-ready in fighting an informationised and intelligentised warfare' as China sees space as a critical domain in international strategic competition. This makes it imperative to understand the nature of China's space programme, the use of space for Chinese military operations and its implications for other countries.

Introduction

In preparing for future wars, militaries around the globe are now developing counter-space technology and space assets. With military activities becoming dependent on the space domain, it is increasingly turning 'outer space' into a theatre of military operations. For instance, in 2019, NATO recognised space as a new operational domain, alongside

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air, land, maritime and cyberspace. The 2020 Defense Space Strategy of the US posited that: “Space is now a distinct warfighting domain, demanding enterprise-wide changes to policies, strategies, operations, investments, capabilities, and expertise for a new strategic environment.”¹ In gauging the threat posed by the development and testing of counter-space technologies by countries, the US categorically identifies “China and Russia”, as:

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“the greatest strategic threat due to their development, testing, and deployment of counterspace capabilities and their associated military doctrine for employment in conflict extending to space. China and Russia each have weaponized space as a means to reduce U.S. and allied military effectiveness and challenge our freedom of operation in space.”²

However, unlike Russia, China is a latecomer to the space race. It was in 2007, that China became the third country after US and Russia to conduct an anti-satellite (ASAT) weapons test that deliberately destroyed one of its defunct polar weather satellites known as Fengyun-1C, in low Earth orbit by a kinetic kill vehicle carried on a medium-range ballistic missile.³ While the test was internationally condemned for generating the largest debris in the Earth’s orbit, but China had a symbolic gain by demonstrating its ability to hit satellites at that range. In 2013, China’s DN-2 rocket test, reached the altitude of the geosynchronous Earth orbit satellites, thus indicating China’s capability to target higher orbits. China created the BeiDou navigation satellite system (BDS)⁴ as an alternative to the US Global Positioning System (GPS), the Russian GLONASS, and

the European Galileo systems. With a total of 35 satellites in orbit, the BeiDou constellation has outnumbered the 31 operational GPS satellites that were in orbit as of May 2020. China has invested in a human space program, known as “Project 921”; in 2003, China sent its first crewed spacecraft into space, making it the third country after the US and Russia to send humans into space; in November 2022, it sent three taikonauts to its recently completed Tiangong space station. Lastly, it plans to build a lunar research station in partnership with Russia by 2035. Besides this, it must be noted that with the above-mentioned achievements and plans, Beijing has made great strides in the creation of military space technology, especially in satellite communications and reusable spacecraft.

These developments highlight that China’s space programme has matured at a rapid pace—from military to civilian space applications. In this context, the paper seeks to examine four key aspects: the nature of China’s space programme, China’s perception of outer space, the role of space in China’s military operations and lastly, the implications of China’s growing space capabilities for India.

China’s Space Programme. The 2022 US Department of Defense (DoD) report notes that China is developing counter-space capabilities that include direct-ascent anti-satellite missiles, co-orbital satellites, electronic warfare, and directed energy systems, that can contest or deny an adversary’s access to space as also operations in the space domain during a crisis or conflict.⁵ Apart from developing capabilities, PRC’s prioritisation of ‘space’ is also represented in the creation of the Strategic Support Force (SSF) in 2015 which heralds an expanded role for space capabilities in Chinese military operations. The other important aspect of China’s growing space capabilities is the ‘space dream’, as the 2022 white paper on “China’s Space Program: A 2021 Perspective”. This quoting President Xi Jinping⁶ is “[t]o explore the vast cosmos, develop the space industry and build China into a space power [...]. In line with this China’s goals for outer space entail:

“to enhance its capacity to better understand, freely access, efficiently use, and effectively manage space; to defend national security, lead self-reliance and self-improvement efforts in science and technology, and promote high-quality economic and social development; to advocate sound and efficient governance of outer space, and pioneer human progress; and to make a positive contribution to China’s socialist modernization and to peace and progress for all humanity.”⁷

Table 1: Timeline of China’s ‘Space Dream’

Year	Target Goal
2020	Long March 8 Carrier will make its debut: Goal Achieved <ul style="list-style-type: none"> • Maiden flight launched on December 22, 2020. • Second flight launched on February 27, 2022, that delivered 22 small satellites into orbit.
2025	Realisation of Suborbital spaceflight.
2030	Launch of 100-tonne heavy lift carrier rocket.
2035	Reusable carrier rocket will be developed.
2040	Nuclear powered space shuttle will be built.
2045	China to become an all-round world-leading country in space equipment and technology.

Source: Annotated by the Author with reference to Ma (2017)⁸ and Newspaper articles.

It is important to note, China’s space dream, as explained by President Xi Jinping in 2013, entails that: “the dream of space flight is an important part of the strong country dream [and] the space dream is an important component of realising the Chinese people’s mighty dream of national rejuvenation [...] it is part of the dream to make China stronger”.⁹ Here, the watchword is ‘stronger’, which indeed has military connotations. To argue, although various civilian entities are involved but the military component is predominant in China’s space programme. The People’s Liberation Army (PLA) holds and

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The organisational structure, infrastructure and affiliations of the Taikonauts, all fall under the PLA, as:¹⁰ First, China National Space Administration (CNSA) falls under State Administration for Science, Technology and Industry for National Defense (SASTIND). Second, the

launch sites, control centres, and many of the satellites are directly run by the PLA. For example, Taikonauts lift off from the Jiuquan Satellite Launch Centre (Base 20 of the PLASSF) directed by the PLASSF's Beijing Aerospace Flight Control Centre, with Telemetry, Tracking and Control support from the Xi'an Satellite Control Centre (PLASSF's Base 26) and on termination of the mission, land at one of two sites in Inner Mongolia operated by the two bases. Lastly, all Taikonauts are active members of the PLASSF, who belong to the Astronaut Corps under the PLASSF Space Systems Department's China Astronaut Research and Training Centre.

Hence, China's space-related objectives and programme must be evaluated in the context of its other significant military changes, all of which are steps towards fighting an 'informationised war', as the 2015 US-China Economic and Security Review Commission report notes:

"Unlike the United States, China does not have distinctly separate military and civilian space programs. Under this nebulous framework, even ostensibly civilian projects, such as China's human spaceflight missions, directly support the development of People's Liberation Army (PLA) space, counterspace, and conventional capabilities."¹¹

Outer Space in China's Military Strategy and PLA's Military Operations

Why the race for dominance in space and counter-space capabilities? The answer lies in preparing for an informationised warfare, where communications and technological dominance, long-range precision strikes, C4ISR [Command, Control, Communications, and Computers (C4), Intelligence, Surveillance and Reconnaissance (ISR)], anti-access anti-denial (A2/AD), and joint force integration are impossible without substantial and varied space capabilities. To argue, precision-guided munitions are ineffective without precise target positions, and battle networks provide C4 aid in utilising ISR, both before and during operations. The PLA is hence increasingly considering using space in its military operations. This perception represents the critical role and significance of space in China's military calculations.

The assessment of the security challenges facing China and the types of war the PLA must be prepared to fight are the main drivers of revisions in the PLA's military strategic guideline. The PLA perceives that "the form of war is accelerating its evolution to informationisation", which calls for China to build a national defence mobilisation system that can meet the requirements of "winning informationised wars and responding to both emergencies and wars".¹² In view of this, the 2015 defence white paper on "China's Military Strategy" was the first official document that delineated "outer space" as "a new security domain" and "a commanding height in international strategic competition".¹³ Furthermore, in 2019, China's defence white paper defined "outer space" as "a critical domain in international strategic competition" and identifies the role of space in "improving the capabilities of joint operations command to exercise reliable and efficient command over emergency responses, and to effectively accomplish urgent, tough and dangerous tasks".¹⁴ As China's national defence aims at "safeguarding China's interests in outer space"¹⁵, the PLA is tasked with: "safeguard[ing] China's security and interests

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in new domains” by “proactively prepare[ing] for military struggle” to “seize the strategic initiative in military competition”.¹⁶

In Chinese perception, the goal of space operations is to achieve space superiority (制天权), defined as “ensuring one’s ability to fully use space while at the same time limiting, weakening, and destroying an adversary’s space forces”,¹⁷ as the *Textbook for the Study of Space Operations*, published by the Academy

of Military Science, entails: “Whoever is the strongman of military space will be the ruler of the battlefield; whoever has the advantage of space has the power of the initiative; having ‘space’ support enables victory, lacking ‘space’ ensures defeat”.¹⁸ Furthermore, the 2013 *Science of Military Strategy* predicts that future wars may begin in outer space and cyberspace and that “achieving space superiority and cyber superiority are critical for achieving overall superiority and being victorious over an enemy”.¹⁹ The military component is very apparent in Chinese scholarly writings that assert that the “control of space is a prerequisite for control of terrestrial domains”, as in Chinese view:

“Space power improves battlefield awareness capabilities, strengthens joint operations systems, improves precision strike capabilities, and increasingly strengthens overall battlefield superiority. Integrated joint operations increasingly rely on space power and space is the high point of informationized warfare.”²⁰

In China’s military strategy, an essential part of PLA’s approach to future wars is the need to secure “information dominance (*zhixinxiquan*;

制信息权)”, for which the PLA needs to “speed up to upgrade weaponry and equipment, and work to develop a weaponry and equipment system which can effectively respond to informationised warfare and help fulfil the missions and tasks”.²¹ In dominance over the information realm, the PLA:

“continues to develop counterspace capabilities—including direct-ascent anti-satellite missiles, co-orbital satellites, electronic warfare, and directed-energy to disrupt [an] adversary’s C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance) advantages through such means as attacking its computer and communications systems. Accordingly, the PLA is establishing information warfare units and capacities, and developing anti-satellite capabilities [and] space warfare weapons.”²²

Specifically, on the growing role of space for the PLA Air Force (PLAAF), the 2019 White Paper suggests:

“In line with the strategic requirements of integrating air and space capabilities as well as coordinating offensive and defensive operations, the PLAAF is accelerating the transition of its tasks from territorial air defense to both offensive and defensive operations, and improving its capabilities for strategic early warning, air strikes, air and missile defense, information countermeasures, airborne operations, strategic projection, and integrated support.”²³

Space significantly factors in the PLA’s operations, as having superior capabilities in space offers the PLA potential military advantages on land, at sea, and in the air. As the 2019 report of the US Defense Intelligence Agency suggests that the PLA views space superiority as well as the ability to control the space-enabled information sphere and to deny adversaries

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their own space-based information gathering and communication capabilities, as critical components of modern “informatised warfare”.²⁴ The creation of the Strategic Support Force in late 2015 to guide the PLA’s space, cyber, and EW missions further exemplifies the growing importance of outer space in PLA’s warfighting and joint combat operations. In 2016, SSF’s newly appointed commander, Gao Jin stated that:

“[T]he SSF will raise an information umbrella (信息伞) for the military and will act as an important factor in integrating military services and systems, noting that it will provide the entire military with accurate, effective, and reliable information support and strategic support assurance (准确高效可靠的信息支撑和战略支援保障).”²⁵

In defining the role and intentions of the SSF in supporting the PLA, the 2019 White Paper posits that:

“The PLASSF is a new type of combat force for safeguarding national security and an important driver for the growth of new combat capabilities. It comprises supporting forces for battlefield environment, information, communications, information security, and new technology testing. [...] the PLASSF is seeking to achieve big development strides in key areas and accelerate the integrated development of new-type combat forces, so as to build a strong and modernized strategic support force”.

In terms of “information support”, the SSF’s support to the PLA involves: centralising technical intelligence collection and management, which provides intelligence support to the theatre commands, enables power projection, supports strategic defence in the space and nuclear domains, and enables joint operations.²⁶ Precisely, the missions of the SSF include: the detection of targets, the reconnaissance and the return of target information; the undertaking of daily navigational operations and the management of Beidou satellites and space reconnaissance; the defence of electromagnetic and cyberspace tasks — the “new areas that determine whether [Chinese] military will win the battle in the future.”²⁷ In this regard, the SSF oversees two deputy theatre command-level departments: the Space Systems Department responsible for military space operations, and the Network Systems Department responsible for information operations, which includes technical reconnaissance, cyberspace warfare, and psychological operations.²⁸ Therefore, outer space figures significantly in China’s military calculations and the PLA’s military modernisation.

Implications for India

China’s space program has matured rapidly however, China’s space capabilities still usually lag behind those of the US and Russia. But its rapid pace of development, makes it ahead of many other countries’ programmes, such as India’s. The worry concerns China’s weaponisation of space as a means to reduce the freedom of operations of other countries in space. Specifically, China’s operational counter-space capability has significant implications as China could employ its counter space capabilities in targeting the space assets of countries with which it has adversarial relations, such as the US and India. The 2017 US DoD report notes that:

“PLA writings emphasize the necessity of ‘destroying, damaging, and interfering with the enemy’s reconnaissance ... and communications

satellites,' suggesting that such systems, as well as navigation and early warning satellites, could be among the targets of attacks designed to "blind and deafen" the enemy."²⁹

India is involved in a boundary dispute with China which has only got worsened in recent times with the Eastern Ladakh stand-off since 2020. Given the tensions at the border with the future scenario of the possibility for armed conflict between India and China over the disputed border, China's expanding space and counter-space capabilities has and will have negative-sum effects on India's security. Hence, India must be ready to face an enemy with space technologies. But since India is a latecomer to the arena of military use of space, India has a significant worry, as evident from the recent remarks of India's Chief of the Air Staff Air Chief Marshal V R Chaudhari, who described the space as "the ultimate high ground", by stating:

"The race to weaponise space has already started and the day is not far when our next war will spread across all domains of land, sea, air, cyber and space. There is a need to develop both offensive and defensive space capabilities to safeguard our assets. We [India] need to capitalise on our initial successes in space and prepare ourselves for the future."³⁰

India's concern stems from the asymmetry in its space programme vis-à-vis China. While Indian government agencies such as the Indian Space Research Organisation (ISRO) and Defence Research and Development Organisation (DRDO) are building India's space-based strategic capabilities, but when juxtaposed with China, India's capabilities are lagging behind both economically and militarily.

Comparative Assessment: China and India (as of 2021)

Parameter	China	India
Expenditure on space	US\$ 11 billion	US\$ 1.5 billion
ASAT Capability Test	Demonstrated in 2007	Demonstrated in 2019
Reconnaissance and remote sensing fleet	120	19

Source: Author's own.

Given China's expanding space-based military capabilities, the query remains: are Indian Armed Forces prepared to counter a Chinese attack? This intervention demands significant attention as PLA's space capabilities aim towards fighting a "system-destruction warfare" while the new operational concept is that of multi-domain precision warfare. The PLA intends to identify key vulnerabilities in the operational system of an adversary, especially such as India, and then launch precision strikes against those vulnerabilities.

What can be expected in case of an armed conflict between India and China? One of the outcomes will entail PRC's employment of its counter-space capabilities to limit or prevent India's use of its space-based assets. Besides, China will use directed energy weapons and satellite jammers, operational ground-based ASAT missile to target low-Earth orbit satellites or destroying satellites up to geosynchronous Earth orbit. In this regard, India should be concerned as China's military space capabilities are being developed with sophistication to counter the US capabilities and this itself, in many ways makes the PLA's capabilities more advanced especially with information dominance, precision strikes and joint operations. Therefore, it becomes an urgent need for India to make big strides in developing its space-based military capabilities- both indigenously as well as in partnership with other countries.

Notes

1. “Defense Space Strategy Summary 2020”, June 2020, p. 1, at https://media.defense.gov/2020/Jun/17/2002317391/-1/-1/1/2020_DEFENSE_SPACE_STRATEGY_SUMMARY.PDF.
2. Ibid.
3. For details see, Brian Weeden, “Anti Satellite Tests in Space- The Case of China”, Secure World Foundation, 16 August 2013, at https://swfound.org/media/115643/china_asat_testing_fact_sheet_aug_2013.pdf, accessed on 8 May 2023.
4. For details see, “The State Council of the People’s Republic of China”, China’s Beidou Navigation System, 17 June 2016, at http://english.www.gov.cn/archive/white_paper/2016/06/17/content_281475373666770.htm.
5. Office of the Secretary of Defense, “Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China”, U.S. Department of Defense, 2022, p. 68, at <https://media.defense.gov/2022/Nov/29/2003122279/-1/-1/1/2022-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF>.
6. China’s National Space Administration, “China’s Space Program: A 2021 Perspective”, 28 January 2022, at <http://www.cnsa.gov.cn/english/n6465645/n6465648/c6813088/content.html>.
7. Ibid.
8. Ma Chi, “China aims to be world-leading space power by 2045”, *China Daily*, 17 November 2017. The timeline in the chart is mapped by China’s Aerospace Science and Technology Corp, the main contractor of the PRC’s space programs.
9. Tian Xiaohui, “Backgrounder: Xi Jinping’s vision for China’s space development”, *Xinhuanet*, 24 April 2017.
10. Taylor A. Lee and Peter W. Singer, “China’s Space Program is More Military Than You Might Think”, *Defense One*, 16 July 2021, at <https://www.defenseone.com/ideas/2021/07/chinas-space-program-more-military-you-might-think/183790/>, accessed on 12 May 2023.
11. 2015 Report to Congress of the U.S.-China Economic and Security Review Commission, One Hundred Fourteenth Congress, First Session, November 2015, p. 13, at https://www.uscc.gov/sites/default/files/annual_reports/2015%20Executive%20Summary%20and%20Recommendations.pdf, accessed on 10 May 2023.
12. “The State Council of the People’s Republic of China”, China’s Military Strategy, 27 May 2015, at http://english.www.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm.
13. Ibid.
14. The State Council of the People’s Republic of China, Full Text: “China’s National Defense in the New Era”, 24 July 2019, at https://english.www.gov.cn/archive/whitepaper/201907/24/content_WS5d3941ddc6d08408f502283d.html.
15. Ibid.

16. The State Council of the People's Republic of China, n. 12.
17. Quoted in Kevin L. Pollpeter, Michael S. Chase and Eric Heginbotham (eds.), *The Creation of the PLA Strategic Support Support Force and Its Implications for Chinese Military Space Operations* (Santa Monica, CA: RAND Corporation, 2017), p. 7.
18. Ibid.
19. Ibid., p. 15.
20. Quoted in Kevin Pollpeter, *Building for the Future: China's Progress in Space Technology During the Tenth Five Year Plan and the U.S. Response* (Carlisle, PA: US Army War College, 2008), p. 25.
21. Ibid.
22. Jeff Kueter, "China's Space Ambitions- And Ours", *The New Atlantis*, p. 11, at <http://www.thenewatlantis.com/docLib/TNA16-Kueter.pdf>, accessed on 10 May 2023.
23. The State Council of the People's Republic of China, n. 14.
24. Defense Intelligence Agency, "Challenges to Security in Space", January 2019, p. 14, at http://www.andrewerickson.com/wp-content/uploads/2019/02/DIA_Space-Security-Challenges_201901.pdf.
25. John Costello, "The Strategic Support Force: China's Information Warfare Service," China Brief, The Jamestown Foundation, Vol. 16, No. 3, at <https://jamestown.org/program/the-strategic-support-force-chinas-information-warfare-service/>, accessed on 10 May 2023.
26. Office of the Secretary of Defense, p. 69, n. 4.
27. "Expert: Strategic Support Forces will be the key to victory throughout the entire operation", *People's Daily*, 5 January 2016.
28. Office of the Secretary of Defense, p. 68, n. 4.
29. Office of the Secretary of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2017", U.S. Department of Defense, 15 May 2017, p. 35, at https://dod.defense.gov/Portals/1/Documents/pubs/2017_China_Military_Power_Report.PDF.
30. Quoted in Kalyan Ray (2023), "India should be ready for space war: IAF Chief V R Chaudhari", *Deccan Herald*, 22 March 2023, at <https://www.deccanherald.com/national/india-should-be-ready-for-space-war-iaf-chief-v-r-chaudhari-1202441.html>, accessed on 20 May 2023.