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A Long March 5B successfully lifts off May 5 on its first flight, clearing the way for future launches of Chinese space station modules. (credit: Xinhua)

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Explaining China's space ambitions and goals through the lens of strategic culture

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We all need conceptual tools for analysis. Strategic culture is one of them. I define strategic culture as a sum of a nation's assumptions about its reality (threats, opportunities) based on which certain policy choices are preferred over others. These policy choices are informed by the state's political culture reflecting both continuity and change over time. Political culture is defined as "a short-hand expression for a 'mindset' which has the effect of *limiting attention to less than the full range of alternative behaviors, problems* [emphasis added], and solutions which are logically possible." Strategic culture flows from political culture, and is mostly applicable to the political and military leaders, whose assumptions, preferences, and choices inform their proclivity to adopt a particular military strategy over others: offense/defense, compellence/deterrence. History, myths and metaphor, and state capacity play a critical role in informing these assumptions. Colin Gray captures strategic culture well in his definition, "the persisting (though not eternal) socially transmitted ideas, attitudes, traditions, habits of mind, and preferred methods of operation that are more or less specific to a particularly geographically based security community that has had a necessarily unique historical experience.

While there have been reasonably developed discussions on grand strategic paradigms and the consequent national strategy and military strategy that follows especially with regard to space warfare, little is understood about the influence of strategic culture (intervening variable) on why states choose certain policy options and not others, specifically in outer space. More critically, each country has its own way to interpret, accept, prioritize, and choose what they perceive as critical, over several other alternative policy options, decisions, and operationalization. Just because the US behaves in a particular way in outer space, it is simply unrealistic to expect every other spacefaring state to behave in a similar way. Other spacefaring states have very different sets of ideas and motivations as to why they are in space or aspire to be there. Some of the ideas animating their

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space discourse may sound similar to the US space power thinking and theories, but they are basically not the same, no matter how much we examine other states' space behavior and policy choices/responses utilizing models familiar to us.

Jack Snyder [coined the term “strategic culture”](#) realizing that US game theoretic models based on rational choices, drawn from American strategic rationality, were spectacularly failing to predict the Soviet Union's strategic behavior vis-à-vis its nuclear strategy. The Soviet military's attitude towards nuclear war differed from the US, and Snyder asserted it was because of a divergent set of strategic assumptions informed by its unique strategic culture. Consequently, a deeper understanding of strategic cultures of other states that informs those strategic assumptions will tell you that states uniquely utilize their own strategic histories, resources, myths, capacities, to formulate their own space priorities to include ideas on space warfare and expansion, and more importantly, the chosen means to get to those goals.

Given this, it is important to understand that China's space behavior, its ambitions, and the means it adopts to get to its space goals is largely drawn from its own strategic culture and geographic location. While there is a visible predisposition to study and explain China's space behavior as a “reflecting mirror” of American space behavior, the reality is different, similar to the differences between American and Soviet strategic rationality. This article offers a perspective on China's space program drawing from its history, strategic culture and geographic location. This understanding is critical in the context of COVID-19 and the world's inability to assess and understand the Communist Party of China (CPC) and its operating principles.

China's space program

China's space program is animated by the country's historical experience, its focus on maintaining access and use (space command and control), the urgent requirement to have enough influencing power to write the rules of space commerce—international legal regulations on who has access and how—and its subsequent development of its military space culture. This need is informed by the simple fact that the countries who most dominated the crafting of the Outer Space Treaty (OST) of 1967 were the US and the Soviet Union.

A comprehensive analysis of the history of the OST titled “Evolution of the Outer Space Treaty” can be found [here](#). Loren Grush [highlights the domineering influence of the OST on international space law](#), 50 years later (2017):

The Outer Space Treaty was never intended to be comprehensive, though. Created when space travel was in its infancy, the agreement was meant to address issues that could arise as space technology advanced. So it is somewhat flexible in its interpretation, as well as limited. But the treaty has still acted as the foundation for every piece of space legislation [emphasis added] that has been created in the past half century.

Besides that, in order to fulfil its space goals—permanent space presence, a lunar base, Space Based Solar Power (SBSP), and deep space exploration—China's space behavior and strategy is informed by its historical texts, to include [Han Feizi](#) and his focus on legalism, an assertive and strong leader, and a strong state; Sun Tzu's [Art of War](#) and his focus on a comprehensive legitimate grand strategy; and Mao Tse Tung's [On Guerilla Warfare](#) on how to gain the initiative by utilizing both engagement and disengagement of the adversary (space warfare). President Xi Jinping has offered us his concept of [China's dream](#), inscribed into [the CPC constitution in 2017](#). This requirement for CPC legitimacy via space achievements is heightened with the impact of COVID-19 on CPC reputation and coherence. Xi has penned articles on how to address the COVID-19 outbreak in the CPC Central Committee's [flagship Qiushi Journal](#) given his leadership is [under close scrutiny externally](#) in the context of the COVID-19 outbreak.

Lessons from the past and future space missions

China has learned strategic lessons from history, especially the long-term impact of the Ming dynasty's conscious decision by 1525 AD to [burn or leave to rot](#) all of the [famous treasure ships](#) built by Chinese admiral and explorer, Zheng He. I visited the China Maritime Museum outside Shanghai in November 2016 and a model of Zheng He's reenacted treasure ship greeted me as I entered, with nostalgia written large of what could have been in an alternate universe if those ships continued to sail and command and control the seas.



Figure 1: Zheng He's Treasure ship in the China Maritime Museum Source: China Daily, 2012

Many latter-day Chinese strategic thinkers assert that this strategic blunder resulted in China suffering from defeat at the hands of British and other Western powers in the 19th century, mostly due to the latter's superior naval technology. Today, naval modernization and technological innovation is of priority to China. Simultaneously, outer space, like the sea, is that other equivalent strategic domain that is of focus. Xi Jinping has embraced the idea of technology innovation and adopting the idea of a silk road here on Earth and [a silk road information corridor in space](#), with China as the lead player, inspired by those historical technological feats of Chinese ancestors. [Xi specifies](#), "History is our best teacher... the glory of the ancient silk routes shows that geographical distance is not insurmountable."

Very clearly, [China is determined to ensure that the misfortune that befell Zheng He and his visionary strategy](#) of "sea command and control" should not repeat itself in space due to lack of strategic foresight. Thereby, the country is seriously expanding its space infrastructure, to include space transportation (heavy lift and reusable rockets, nuclear propelled spacecraft) space presence, and space capacity, with 30-year timelines (2020–2049) that include investments in SBSP, space mining, and a well demonstrated lunar exploration program. In October 2019, China Space Sanjiang Group (CSSG) and [Vipioneers](#) demonstrated a 5G-enabled unmanned mining truck, that is fully automated. CSSG conducts research in solid-fueled ballistic missile technology, stealth and counter-stealth technology, and [is subordinate to the China Aerospace Science and Industry Corporation \(CASIC\)](#). China has been investing in 3D printing, and robotics that enable in-space manufacturing and in-situ resource utilization (ISRU): capabilities required for constructing structures/bases in space and other celestial bodies.

In a promotional video released by the China Academy of Space Technology (CAST) about a next-generation spacecraft, the company proclaims that is is part of "our relentless pursuit of the space dream."

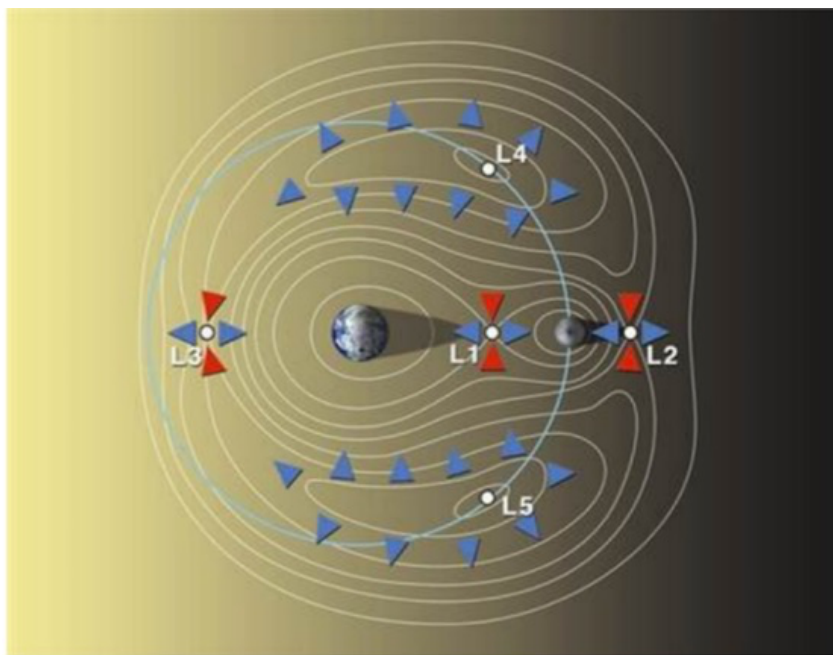
Sometimes in the next year, China will launch the first of its ten robotic missions to construct its space station—Tianhe, harmony of the heavens—340 to 450 kilometers above the Earth's surface. Once the space station construction is completed by 2022, six Chinese taikonauts can live there. The Long March 5B, capable of carrying 25 tons to low Earth orbit (LEO) and which enables construction of this space station, made its inaugural flight earlier this month.

China is investing in developing a new spacecraft that aims to take humans to the Moon. This new spacecraft is designed to carry four to six astronauts beyond LEO, overtaking the Shenzhou spacecraft that can only venture to LEO. In a promotional video released by the [China Academy of Space Technology \(CAST\)](#), the spacecraft, consisting of a crew and service module with some reusable features, is described as enabling Chinese taikonauts to land on the lunar surface and explore deep space. The writeup for the promotion video proclaims that is part of "our relentless pursuit of the space dream."

Cislunar focus

In order to maintain access and use of space, and successfully meet its space goals, China is keenly aware that besides human and robotic presence in LEO, especially for space-based Earth support systems, it is smarter to develop capability to demonstrate presence and control in cislunar space (see figure 2) to ensure that China has the dominating influence when rules of regulating cislunar space are crafted. We already see such activities in

the US with regard to the discourse on space resources with the Commercial Space Launch Competitiveness Act of 2015 and now President Donald Trump's Executive Order on recovery and use of space resources. The race is on, though China has had a head start with its Chang'e 4 mission landing in January 2019 on the lunar farside. As noted earlier, the Chinese path to the Moon is animated by its strategy of a long-term settlement vision drawn from a lesson China learned, from the crafting of space laws and norms during the 1960s and 1970s, that being somewhere first really matters for who gets to create the enabling regime that benefits them. China, by its focus on demonstrating cislunar presence, aims to ensure that its influencer role will be the greatest. Think of a scenario where the United Nations Office for Outer Space Affairs (UNOOSA) meets to discuss how countries and their private entities should be regulated on the far side of the Moon, or how international treaty law and customary space law is to be applied if there are resources to be mined there. China, with its active presence on the far side of the Moon (Chang'e-4) has clear advantage over the rest of us.



David A. Kring / LPI-JSC Center for Lunar Science and Exploration

Figure 2: Cislunar Space Source: NASA, 2012

From a Chinese strategic culture perspective, such space identity and influence can be gained from four critical capabilities in space: possessing capability to send humans to space and showcasing human sustainable presence, traveling to cislunar space, a capability to target space objects with anti-satellite (ASAT) weapons, and possessing a permanent space presence capability. China has demonstrated three such capacities, including human presence in LEO through its Tiangong space station, traveling to the lunar orbit and robotic soft landings on the Moon, an ability to then go to a completely different orbit and fly past an asteroid, and its 2007 ASAT test. China is in the process of developing the permanent space presence capacity with its permanent space station.

In all of this, a major focus area is on its lunar presence capacity, simultaneously dominating the space between the Earth and the Moon. One of China's top military space officials, Lieutenant General Zhang Yuilin is former deputy head of China's Armament Division, Central Military Commission (CMC) who is dual-hatted as deputy chief of its Manned Space Mission, and is now a top military space officer with the PLA Strategic Support Force (PLASSF). He [made this strategic focus clear when he stated](#), "China will manage to exploit the space between Earth and the Moon for solar power and other resources after it builds a space station in 2020... The Earth-Moon space will be strategically important for the great rejuvenation of the Chinese nation."

It can be inferred from Chinese space scientists, policymakers, and academic writings on space that "if we do not establish presence somewhere first, and take the initiative, we cannot compel others to give up on behavior harmful to us."

This is an example of clear directed strategy influencing China's space technology development. Cislunar space has strategic advantages due to its intrinsic qualities, starting with, lunar resources like water ice, iron ore, titanium, platinum, nickel, and helium-3. Second, the "command and control" of cislunar space is critical. The Lagrange points may be important crossing points between Space Lines of Communications (SpLoCs), serving as chokepoints, which could facilitate or inhibit space commerce depending on who is in control of them. I define SpLoCs as those lines of communication that support communication to, in, and from space. It is akin to the Sea Lines of Communications (SLoCs) that are vital for sea presence, command and control. SLoCs are vital

nodes for our seaborne trade and commerce.

In the Chinese strategic mind, across a broad spectrum, there are shared assumptions—ideas, decisions, and patterns of behavior—that is viewed as the preferred option. In this, it can be inferred from Chinese space scientists, policymakers, and academic writings on space that “if we do not establish presence somewhere first, and take the initiative, we cannot compel others to give up on behavior harmful to us.” In a nutshell, it is China’s strategy of compellence. Interestingly, in the Chinese strategic mind, an act to induce compellence in an adversary need not follow a classical Western escalation ladder conception. Once the strategic purpose is fulfilled or met via compellence and the message is delivered to the adversary or competitor with the first initiative, there is room to adapt and change. A recent example of such behavior is the building of artificial islands in the South China Sea. Through this act, the CPC aimed at compelling countries like Philippines and Vietnam to give up their international arbitrations over the islands, as much as it was about staking claim on disputed areas through physical sustainable presence. A historical example is China’s border attack on India in 1962. Mao Tse Tung and Zou Enlai perceived India’s forward policy of building border posts in 1961 as aggressive, and conceived of a border war to compel India to give up on building these forward posts in territory that India perceived as its but China claimed it. Once that message was delivered, China unilaterally withdrew.

Space command and control

This strategic mindset will not differ in the domain of space. The strategy that will guide China’s space war fighting capability will be a combination of offense and defense, aimed at compellence. While the PLASSF is guided by a principle to augment information warfare in local conditions, meaning utilizing space and cyber assets to offer military advantage to China in conflict and in peacetime, it is also vitally critical to carry that information domination beyond LEO and GEO into the Moon’s orbit and beyond. Some strategic points of critical importance are L1, L2, L4, and L5 Lagrange points. One of China’s most sophisticated satellites, Queqiao (magpie bridge), is right now in an L2 halo orbit, serving as a relay communications satellite between Chang’e-4 and Chinese receiving stations on Earth.

China’s strategic need to dominate the space lines of communication is to avoid its predicament on Earth. On Earth, China perceives vulnerability in its sea lines of communication primarily because of the dominant presence of the US Navy and its allied countries in the Pacific. This has resulted in a feeling of Chinese strategic vulnerability, including lack of control over chokepoints like the Malacca Straits (connecting the Pacific with the Indian Ocean), a narrow sea passageway between Indonesia and Malaysia. Eighty percent of China’s energy imports from the Middle East have to pass through this chokepoint. Former Chinese President Hu Jintao highlighted China’s “Malacca Dilemma” concept especially if a conflict broke out and rival naval powers block this waterway, thereby cutting off China’s supply of energy and by extension crippling the Chinese economy. The *China Youth Daily* went so far as to specify, “it is no exaggeration to say that whoever controls the Strait of Malacca will also have a stranglehold on the energy route of China.” Chinese strategic calculus has developed several alternate sea routes, popular amongst them being [the second coast route](#) via the Bay of Bengal, Myanmar, and into Yunnan, China. China simply does not want a repeat of this scenario in space where it cedes control of critical space lines of communication to some other adversarial nation. Its Belt and Road Initiative (BRI), which includes space, is a critical component of ensuring Chinese access and influence and addressing this strategic vulnerability.

Naming of space territory

A way to ensure claim and first presence is the naming of sites in Mandarin. We see this reflected in Chinese attempts to name the disputed islands in South China Sea and East China Sea. Spratly Islands in the South China Sea are called Nánshā islands (南沙群岛). The East China Sea islands are called Diaoyu islands (钓鱼岛). The Paracel islands are called Xisha group of islands (西沙群). Even [the seas have different names](#) for the countries that dispute the islands. The East China Sea is called Dong Hǎi (东海) and the South China Sea is called Nan Hǎi (南海) by China. A similar pattern of behavior is observable in [China’s naming of areas in Antarctica](#) with Chinese names.

Naming a territory is critical in Chinese conception of legitimacy and consequent “first presence” right especially in their strategy of cislunar command and control. The location on the Moon’s farside where Chang’e-4 landed last year has been named Statio Tianhe.

Given their own history of losing control of the near and high seas, China highlights the critical significance of the Moon and cislunar space over everything else.

This name included the lunar landing site as well as three craters and a hill. Liu Jizhong, director of the China Lunar Exploration and Space Engineering Center of the China National Space Administration (CNSA), stated that the name was approved by the International Astronautical Union (IAU) thereby conferring international legitimacy, a move in diplomacy much prized by the CPC. China also named the hill that was utilized to locate the Chang’e 4 as Mons Tai, with Tai signifying the five great mountains of China. Already, China has named the

landing site of the Chang'e 3 as "Guang Han Gong" or "Moon Palace".

Such activities of naming lunar territory must be viewed through the lens of Chinese strategic culture where territoriality, Chinese names, and first presence offer special privilege. To re-emphasize again, during the Cold War between the US and the USSR, one of the drawbacks was the American strategic community's failure to correctly gauge Soviet responses. American game theoretic models based on rational choice were heavily influenced by American ethno-centric perspectives and thereby failed to account for Soviet strategic culture as a unit of analysis in their matrix of analyses. More critically, countries differ in how they locate meaning and context to certain strategic outcomes and policy behavior. How Chinese strategic thinkers view such naming of territory and first presence could differ from other countries. Moreover, utilizing Thucydides' *The History of the Peloponnesian War* or Carl von Clausewitz's *On War* could be helpful to an extent to understand China's space warfare but will not offer a full picture. Instead, applying Chinese classical texts on warfare, like Sun Tzu's *Art of War*, Wei Liaozi's [text on military strategy](#), [three strategies of Huang Shi Gong](#) and several others, supplemented by military writings of CPC top leaders like Mao, Deng Xiaoping, Jiang Zemin, Xi Jinping should prove far more insightful.

In conclusion, in order to assess why China prioritizes certain space goals and ambitions over others can be understood through their strategic culture, history, and context. Given their own history of losing control of the near and high seas, China highlights the critical significance of the Moon and cislunar space over everything else. Their space technology development is dictated by their strategy of creating a favorable strategic theater for themselves. While showing off space science and exploration missions is respected, it is far more advantageous to have a long-term strategy of expansion and exploitation. This Chinese preference is based on their own political culture, and the subset of their strategic and military culture. For China, the Moon and its orbit, and the Lagrange points, have significant strategic advantage for both their lunar exploration and exploitation goals, their plans for a SBSP satellite launch, in-space manufacturing and mining, as well as further exploration into the asteroid belt and Mars. Establishing a lunar research base by 2036 is the first step towards such conceptions of space command and control. More importantly, from a legal point of view, even if such lunar bases are led and established by PLA personnel (since China's space program is led and dominated by the PLA), China realizes that it would not violate OST prohibition of military bases, since these research bases, China asserts, will be for peaceful purposes. The OST does not prohibit the participation of military personnel in space so long the intent is peaceful. [Article VI of the OST](#) is clear in that regard:

The Moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. *The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the Moon and other celestial bodies shall also not be prohibited.* [emphasis added]

China's doctrine of spacepower, the theory of spacepower and the role of tactical, operational, and strategic concepts for the space warrior will play a critical role in informing its space behavior. The example of the sea is pertinent to understand why China wants to be the number one space power by 2049 through the medium of space exploration, exploitation, and expansion. It simply does not want a repeat of its past strategic mistakes. Given the COVID-19 pandemic and its long-term implications, and the CPC's role in misrepresenting facts in the first months of spread of the virus, we will have to decide whether we are comfortable with an authoritarian CPC having so much spacepower in the high frontier.

□

Dr. Namrata Goswami is a senior analyst and author. Her work on "Outer Space and Great Powers" was supported by the MINERVA Initiative Grant for Social Science Research. Currently, she is working on a book on "Great Powers and Resource Nationalism in Space" to be published by Lexington Press, an imprint of Rowman and Littlefield. All views expressed here are her own.

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Dwayne Day · 11 hours ago

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China is going to try to develop space-based solar power and mine the Moon for Helium-3? Those interested in space-based solar power don't understand the role of decimal places, and those interested in Helium-3 don't understand the history of fusion energy development.

Let's hope they choose to spend lots of money on these things.

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