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Abstract

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Keywords: Arms Race in Space, US-China Rivalry, India Ambitions, Offensive-Defensive Approaches

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Title

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Abstract

The Article aims to investigate the strategic purpose of space as a new battlefield among the great powers of the 21st century. The US sees China as its great adversary in space hence its cooperation with India for strategic purposes to engage China which is posing a national security threat to China. Similarly, increasing Indian space capabilities is also misbalancing the pendulum of power in South Asia. The offensive and defensive approaches from the broader framework of Neo-Realism have been employed to interpret the whole power competition. Qualitative research methodology grounded in post-positivism has been employed. Data would be gathered through the help of primary & secondary sources and document study would also be utilized for data analysis. The findings of the study are expected to show that an arms race in space can cause space warfare among major global powers.

Contents

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Introduction

Wars have traditionally been confined to land, but technological advancements have expanded the arenas of conflict to include the sea, air, and now space. In the context of Astro-politics, the US-India strategic cooperation in space marks a significant shift in modern warfare and geopolitical strategy (Johnson & Patel, 2023). This partnership includes

satellite surveillance, missile defense systems, and the development of space-based military capabilities, enhancing both nations' abilities to monitor and respond. The implications for China are substantial, as this alliance not only bolsters US-India defense positions but also drives China to advance its space capabilities to maintain strategic parity. The extension of military competition into space underscores the evolving nature of conflict, where achieving dominance in this final frontier is becoming as crucial as control over land, sea, and air in reshaping global power dynamics and national security policies (Brown & Wang, 2024).

In Todd Harrison's report, "Space Threat Analysis 2022," it is highlighted that outer space is considered a legally non-sovereign domain, meaning no single country has the authority to control all objects moving through it. As a result, nations are limited to governing only the space objects that are orbiting under their own jurisdiction (Larsen, 2019). Despite attempts to preserve peaceful access to outer space, various actors frequently encounter competition and conflict. Each entity aims to safeguard its legal activities and protect its interests in the space domain. The ambition regarding space superiority by advanced states is going to increase the militarization of space and the looming threat of its weaponization, sparking fears that space could evolve into a battlefield in the future (Harrison, 2022). After the WWII period, the advancement of counter-space weapons by various countries has raised alarms about a possible space arms race, as well as the heightened risk of conflicts that could lead to catastrophic consequences. Astro-politics builds upon the ideas of global geopolitics from the 19th and 20th centuries, expanding them into the context of humanity's exploration and growth beyond Earth into outer space (C.Dolman, 2005)

Erwin suggests that the United States is entering a new phase of intense competition between major powers, with China being recognized as a primary strategic rival. Furthermore, the United States considers Beijing’s progress as the most threatening to its space adventures (Strategy, 2020). Washington has come to the conclusion that space is a crucial area for future conflicts, causing its weaponization and transforming into an emerging area of conflict. Satellites, in particular, have emerged as key assets in military operations, frequently targeted in conflicts since the Cold War. The US military sees satellites as vital components in global power dynamics, comparing their strategic importance to that of pawns in a geopolitical chess game (Erwin, 2021)

China's pursuit of space technology is heavily influenced by its national interests, with national security serving as the primary motivation for its leadership. However, as the program advances, China is anticipated to increase its focus on commercial and scientific activities, extending the competition into the economic and strategic spheres. These developments are expected to challenge the United States' space dominance, mirroring how China is currently contesting U.S. influence in diplomatic, military, and economic arenas. In response to this shared challenge, the U.S. has taken significant steps to bolster India’s space capabilities by granting access to advanced military technologies crucial for space operations. This cooperation has been further strengthened by India's inclusion in pivotal export control frameworks, such as the MTCR, the Wassenaar Arrangement, and its designation under STA-1. These agreements not only facilitate the exchange of technology but also open up new avenues for collaboration in space security. Moreover, the signing of the India-U.S. BECA underscores India’s growing stature as a key player in the global space arena, positioning it as a rising space power with enhanced strategic capabilities.

Historical Background

Space exploration gained momentum after WWII, driven by intense competition between the United States and the Soviet Union. This rivalry, known as the "space race," began with the Soviet Union's successful launch of Sputnik 1 on October 4, 1957, marking the first artificial satellite to orbit the Earth. This event ushered in a new chapter in space exploration, as both nations sought to assert their technological superiority and ideological influence. In response, the U.S. founded NASA in 1958, leading to numerous groundbreaking achievements, including the U.S. Apollo program, which culminated in the Apollo 11 Moon landing in 1969.

According to James Larsen, while the 1967 Outer Space Treaty laid the groundwork for governing space activities, it now needs to be updated to tackle the evolving challenges of the present and future (Larsen, 2019) International

space law began to take shape during the early stages of space exploration: The Outer Space Treaty of 1967 was signed during a time when the emergence of private satellite enterprises was not anticipated by the signatory states. Since then, space technology has advanced dramatically, created under the guidance of the United Nations Office for Outer Space Affairs (UNOOSA), which lays out the fundamental principles guiding international space activities. A central principle of the treaty is that states are liable for all space-related activities conducted within their territories, regardless of whether they are performed by governmental agencies or private companies. Consequently, countries that are party to the treaty, such as the US and the UK, bear the responsibility of regulating and supervising commercial space operations and personnel, depending on where the space object is launched or acquired (Rees, 2024).

A historical review of the Washington-Beijing engagement highlights the interconnected efforts of both nations and provides insight into the origins of their current actions and ambitions. Over time, their relationship has fluctuated between mistrust and attempts at reconciliation. From the outset, significant decisions made by the U.S. have often led to unintended consequences that were contrary to its initial goals. The U.S. has been involved, directly or indirectly, throughout the various stages of China's space program—from its early development to its current rapid progress—shaping it through key policy decisions.

Unlike many other nations, India's early space initiatives were primarily focused on peaceful objectives rather than military ones. The Indian space program officially commenced in 1962 with the creation of the Indian National Committee for Space Research (INCOSPAR). By 1973, India embarked on the development of its own Space Launch Vehicle (SLV), leading to a significant milestone on July 18, 1980, when the Rohini satellite was successfully launched into low Earth orbit. This achievement made India the seventh nation to attain space launch capability (Goswami, 2020).

Objectives

This research focuses on the scope and dynamics of US-India space cooperation, to evaluate its strategic implications for China and to explore the historical context, and recent developments in US-India space relations, identifying key areas of collaboration and their potential implications.

The main objectives of this research are given below:

- To aim to explore the historical context and recent developments in US-India space relations, identifying key areas of collaboration and their potential benefits.
- To analyze the scope and dynamics of US-India space cooperation and to evaluate its strategic implications for China.
- To investigate the consequences and challenges resulting from disparate space rivalry and seek to see how this partnership influences the strategic landscape in Asia, particularly concerning China's space and defense capabilities.

Research Questions

1. What is the history and nature of strategic cooperation between the USA and India in space?
2. What are the potential security implications for China, particularly in terms of satellite surveillance, Chinese military operations, and missile defense?
3. In what ways could US-India space cooperation influence the regional security architecture in space, and how might China respond to mitigate perceived threats?

Significance of the Study

The importance of the literature on US-India strategic cooperation in space is multifaceted, with profound implications for geopolitical dynamics, particularly concerning China. This partnership enhances both nations' capabilities in satellite technology, space exploration, and defense applications, thereby strengthening their technological and strategic edge. For China, the US-India collaboration signals a counterbalance to its growing influence in space and regional dominance, potentially intensifying the strategic competition in Asia. The study provides crucial insights into how space cooperation between two of the world's largest democracies could reshape regional power structures, foster innovation, and create a new frontier for strategic alliances and competition.

Literature Review

The progress of the US space program has been an extraordinary journey characterized by groundbreaking technological advancements and significant exploration achievements. It officially began in 1958 with the creation of NASA, following the USSR's launch of Sputnik. Over time, NASA shifted its focus from lunar missions to the construction of space stations, including Skylab and the International Space Station (ISS), in collaboration with global partners. The space shuttle program, which operated from 1981 to 2011, introduced reusable space travel and facilitated critical scientific research in orbit. Recently, the U.S. space program has increasingly relied on public-private partnerships, particularly with companies like SpaceX, driving advancements in human spaceflight with goals extending to Mars and beyond.

In 2019, the United States implemented major reforms in its military space operations. In March, the Department of Defense (DoD) formed the Space Development Agency (SDA) to expedite the acquisition of space technologies through innovative approaches. By August, the U.S. established the U.S. Space Command (USSPACECOM), a combatant command focused on deterring threats, protecting the United States and its allied interests, delivering space combat capabilities, and enhancing joint warfighter training. In the same year, Congress passed the Fiscal Year 2020 National Defense Authorization Act, formally establishing the U.S. Space Force as a new military branch tasked with organizing, training, and equipping space forces for the Joint Force. These reforms mark a significant strategic shift in U.S. space operations, underscoring the increasing role of space in national security and defense policy (Phipps, 2020). The Wolf Amendment, enacted by the U.S. Congress in 2011 and named after former Congressman Frank Wolf, restricts NASA from using federal funds for direct, bilateral collaboration with the Chinese government or organizations connected to China. This restriction applies unless explicit approval is obtained from both the U.S. Congress and the Federal Bureau of Investigation (FBI). Since its introduction, the amendment has been included annually in appropriations bills.

Strategic Purpose of the Indian Space Program

Since the early 1960s, when India launched its space program, the country has viewed space exploration as an essential tool for tackling a variety of societal issues, especially given its size and status as a developing economy. Over time, India has successfully joined the group of spacefaring nations and is now focused on strengthening its role as a fully developed space power. The nation aims to achieve technological self-sufficiency across a broad spectrum of space-related endeavors (Prasad, 2019). A significant milestone occurred in 2019 with India's Mission Shakti ASAT test, where the country successfully destroyed its Microsat-R satellite. This test highlighted India's capacity to strike targets in space, a capability that had been under development by the DRDO since 2012 but was publicly demonstrated for the first time. It also marked DRDO's entry into space operations, an area previously managed by ISRO, the civilian space agency.

This event marks a notable transformation in India’s grand strategic approach. Historically, India has been careful in managing its international reputation, but under the leadership of the current BJP government, it has adopted a more assertive stance globally. This shift was particularly evident in India's dismissive reaction to global concerns about space debris after the 2019 ASAT test. PM Modi stressed that enhancing military space capabilities was vital for India's defense, given the country's significant dependence on space assets (Goswami, 2020). New Delhi's space initiatives have evolved through two distinct stages. The initial phase, lasting about two decades, prioritized building foundational infrastructure and experimenting with systems that had limited capabilities. The subsequent phase shifted focus toward developing and flight testing more advanced systems. Today, India maintains a fleet of 53 satellites, each serving specific purposes such as navigation, communication, defense, and remote sensing (Zeeshan, 2024)

A concise overview of the vehicles used in New Delhi's space mission is provided below to establish a foundation for understanding their potential impacts for upcoming years. These vehicles include the SLV, ASLV, PSLV, GSLV-I/II, GSLV-III/IV, and the RLV (Niazi, 2015). India's space program began

in the 1960s with an initial phase focused on establishing an administrative framework and acquiring basic experience in rocket operations. The latter part of this phase was dedicated to enabling Indian scientists to develop expertise in building and operating satellites and launch vehicles. The program's second phase, which started in the mid-1980s, shifted towards more advanced and mission-specific systems. This phase saw the development of the Polar Satellite Launch Vehicle (PSLV) and its successor, the Geosynchronous Satellite Launch Vehicle (GSLV), designed to launch the Indian Remote Sensing (IRS) satellites and the Indian National Satellite (INSAT) system for meteorology and telecommunications (Niazi, 2015)

From a strategic perspective, India, which historically concentrated on leveraging space technology for development, has increasingly integrated space activities into its foreign policy and diplomatic efforts in recent years. Alongside this, there has been a significant shift towards prioritizing security and defense-related space initiatives, aligning India's space program with the approaches commonly seen among other major space powers. This policy evolution encompasses four key aspects: projecting soft power through its space capabilities, utilizing space activities as a tool to advance foreign policy objectives, focusing on military applications (primarily defensive with some offensive capabilities), and restructuring institutional frameworks to address emerging space security needs more effectively.

India made a notable entry into the global counter-space arena in 2019 by conducting its first anti-satellite (ASAT) test, becoming the fourth nation to successfully demonstrate direct-ascent ASAT capabilities. The Indian space sector continued to expand in 2022, particularly with an emphasis on military and private satellite imaging. In October 2022, Prime Minister Narendra Modi introduced the Mission Defense Space Program, identifying 75 defense-related space mission areas for private industry participation. These missions were divided into five main categories, focusing on space technologies for both civilian and military use: satellites, launch systems, software, ground infrastructure, and communications and payloads (Bingen, 2023)

Agreements regarding Strategic Space Cooperation between USA and India

Wassenaar Arrangement (WA)

India's accession to the Wassenaar Arrangement (WA) on December 8, 2017, granted it the ability to obtain dual-use military technologies, which remain restricted for access by non-member countries (Biswas, 2016) India's membership in the Wassenaar Arrangement (WA) has significantly accelerated the modernization of its military capabilities. This affiliation has contributed to the advancement and sophistication of India's space program. The successful testing of Anti-Satellite (ASAT) technology in March 2019 highlights India's growing aspirations for space dominance, reflecting its desire to secure control and influence in terrestrial, regional, and outer space arenas. After Acquiring the space weapons, India poses a challenge to the existing space capabilities of other nations, particularly China and Pakistan, prompting them to enhance their own space defense systems. The possession of ASAT technology by the USA, Russia, China, and India indicates a move towards the militarization of outer space, raising concerns about potential space-based or cyber conflicts in the future.

Indian Membership of Missile Technology Control Regime- MTCR

New Delhi became a member of the Regime on 27th June 2016, marking a significant step forward in advancing its missile development program. This membership granted India access to sophisticated missile technologies, including ballistic missile systems, without the need to dismantle its existing ballistic missile technology—an exception facilitated by the United States. Despite being categorized as a non-Nuclear Weapon State (non-NWS) or an unrecognized NWS, India has managed to preserve and further develop its ballistic missile capabilities. Acquiring advanced missile technology from the U.S. is expected to enhance India's offensive capacity, potentially enabling cross-border strikes that could threaten the security of both China and Pakistan. India's MTCR membership is also poised to strengthen its missile, space, and nuclear programs, exacerbating the military imbalance between India and Pakistan and intensifying the regional arms race in the region. Furthermore, this membership has provided India with access to

advanced defense technologies such as Ballistic Missile Defense (BMD) systems, Anti-Satellite (ASAT) capabilities, Intercontinental Ballistic Missiles (ICBMs), and cruise missiles, enabling the modernization of its defense and space sectors. The MTCR also offers its member states access to critical missile technology, supporting the expansion and upgrading of their missile, space, and nuclear capabilities (Khalid, 2021)

Strategic Trade Authorization-1 (STA-1) and Status of India

The U.S. grants the Strategic Trade Authorization (STA) license exemption to NATO allies and countries that participate in the four major export control regimes: The Nuclear Suppliers Group (NSG), the Wassenaar Arrangement (WA), the Missile Technology Control Regime (MTCR), and the Australia Group (AG). This exemption permits these countries to import sensitive dual-use technologies from the U.S. for military, defense, and space applications without needing a specific license for each transaction. According to Pakistan Today (2018), the STA exemption allows for the export, transfer, and re-export of certain technologies to eligible countries. India recently achieved STA-1 status, becoming the 37th country to do so, an upgrade from its previous STA-2 status. This advancement allows India broader access to advanced technologies. STA-1 is particularly crucial for India, as it provides access to technologies in sectors such as electronics, lasers, sensors, information security, telecommunications, aerospace, and nuclear technology. This access is expected to strengthen India's nuclear and space programs, enhance its national security, and reinforce its stance on nuclear non-proliferation, while also potentially escalating the security dilemma and arms race in South Asia (Khalid, 2021)

Modi Regime and Indian Space Program

India's recent efforts to protect national interests in space reflect the shift from Nehruvian ideals to Hindu nationalist ambitions. Under the Congress Party, India's space program focused on missions that developed its diverse and rural population before expanding into space exploration missions aimed at boosting national prestige. Under Modi, India's space policies have emphasized economic development and safeguarding national security interests. Modi increased India's space budget by over twenty percent in 2017 and India has created new space-focused military commands, expanded military space capabilities, and advanced anti-satellite weapons. India's 2017 joint military doctrine articulates the ongoing policy transformation (Phipps, 2020)

India's military space achievements have lagged behind its civilian space program and India's civilian space programs continued unchanged until the 2007 Chinese ASAT test, which shifted India's security perspective. In response, India established the Integrated Space Cell, a joint organization comprising personnel from all forces. This cell aimed to unify the military's space-related activities and enhance cooperation between civil and military bureaucracies.

Nature of US-India Space Cooperation

India is willing to enhance its security cooperation with the US but remains cautious about forming a formal alliance that could be perceived as anti-China. Despite this restraint, the U.S. continues to regard New Delhi as a pivotal player in its efforts to counter Beijing's expanding global influence. The 2017 U.S. National Security Strategy (NSS) marked a significant shift by emphasizing great power competition and acknowledging India as a "leading global power and stronger strategic defense partner." The NSS further highlighted plans to strengthen the defense and security ties with India, designating it as a Major Defense Partner. As both nations collaborate on various initiatives, including space-related projects, India is simultaneously advancing its space exploration agenda with other Quad members (Rajagopalan, 2021).

In response to China's successful anti-satellite weapons test in 2007, India’s military and strategic community quickly recognized the necessity of bolstering the nation's space defense capabilities. This recognition prompted the formation of the Integrated Space Cell within the Integrated Defense Services in 2008, followed by the creation of the Space Security Coordination Group in 2010 to further enhance coordination and strategic oversight. As part of India's efforts to strengthen its defense framework, the country launched key satellites, including RISAT-2 in 2009 and GSAT-7 in 2013, specifically for strategic and surveillance purposes. A major leap in India’s space collaboration

came in 2020 when its space capabilities were acknowledged as a partner in a U.S. strategic framework, following discussions during President Donald Trump's official visit to New Delhi. This dialogue emphasized the shared goals of space exploration and space domain awareness, highlighting the growing importance of space as a key element in the defense partnership between the two nations with increasing global competition for space resources, particularly in lunar mining, discussions on space resource management are anticipated to intensify within India's society and policy circles.

Research Methodology

The research highlights the transformative impact of US-India strategic cooperation in space and its implications on China and Pakistan. The research methodology applied in this study adheres to a qualitative approach to analyze data and interviews to draw conclusive insights from the content, driven by several justifications that underscore the appropriateness of this research paradigm (Patton, 2015; Creswell & Poth, 2017). Moreover, qualitative research facilitates the generation of actionable recommendations by providing a deep understanding of the underlying factors influencing the strategies of all four actors. The intrinsic nature of the study dictates a qualitative assessment rather than a quantitative collection of numerical data. To address the research questions effectively, we have employed two distinct methodologies: historical research and exploratory research. Historical research involves primary material and ethical considerations are paramount, while exploratory research utilizes secondary data to delineate the scope and nature of the issue at hand (Stebbins, 2001).

Landscape of Chinese Space Program

Beijing's space exploration, initiated in 1958 shortly after the USSR's launch of Sputnik-1, encountered significant setbacks due to the difficulties brought on by the Great Leap Forward and the Cultural Revolution. Despite these early challenges, China's space efforts have advanced at a remarkable pace. Today, it ranks second globally in terms of the number of operational satellites, trailing only the United States, with over 120 intelligence, surveillance, reconnaissance (ISR), and remote sensing satellites in orbit. More than just a matter of technological achievement, China's space program holds profound political and cultural significance. It is a source of immense national pride and plays a central role in President Xi Jinping's vision of the "China Dream," which emphasizes building a prosperous and powerful nation.

Since launching its first satellite in 1970, China has grown into a formidable space power. The establishment of its Low-Earth orbit space station, Tiangong, and other notable achievements underscore its progress. In 2021 alone, China carried out 52 space launches, with only three failures, and reportedly tested a hypersonic glide vehicle. Moreover, in May 2021, China became the second country to successfully land and operate a rover, Zhurong, on Mars, which continues to send critical data back to Earth. China's focus on expanding its civil, intelligence, and military space capabilities is in line with the goals outlined in its 2016 space activities white paper, which seeks to position China as a global space leader. This ambition was further reinforced by the 2021 space white paper, released in January 2022, detailing China's strategic vision for its space development over the next five years and its aspiration to shape international space governance (Harrison, 2022)

In 2012, under the leadership of Xi Jinping, the Chinese Communist Party (CCP) launched the strategy of "the great rejuvenation of the Chinese nation," aiming to transform China into a prosperous and powerful nation by the mid-21st century. As part of this vision, Xi outlined a goal to advance the People's Republic of China (PRC) from being a "major space power" (hangman daguo) to a "strong space power" (hangtian qiangguo), with the ultimate aim of surpassing the United States in space dominance by midcentury. This ambition highlights China's recognition of space as a crucial element in bolstering its political, economic, and military strength.

China currently stands as a formidable player in satellite operations, second only to the United States, with an impressive total of 323 satellites orbiting the Earth. These satellites encompass a wide range of capabilities, supporting various space missions critical to China's national and strategic interests. A key milestone was reached in 2020 when China successfully implemented global, all-weather, 24-hour remote sensing technology,

significantly enhancing its space-based surveillance and communication capabilities. The establishment of the BeiDou global navigation satellite system further solidified China's position as a major competitor to the U.S. GPS system. Furthermore, China is making strides toward expanding its space infrastructure, with plans to complete a multi-module space station by the early 2020s, showcasing its long-term commitment to space exploration and technological innovation (Pollpeter, 2020)

China's space surveillance capabilities have become pivotal in supporting the advancement of its BRI initiatives. China has developed a broad network of space surveillance structures, including ground stations spread across various regions, extending even to South America. Chinese military officials and analysts emphasize the strategic importance of space, describing it as the ultimate "high ground" in global dominance, where controlling space is tantamount to controlling the Earth. In the interim, PLA strategists have recognized space as a critical vulnerability in the defense systems of their adversaries. They believe that by disrupting their opponents' space-based operations, they could significantly impair their overall military capabilities. This disruption would not only affect intelligence and communication systems but also hinder the coordination of long-range strikes and force deployments, offering China a strategic advantage in any potential conflict. To enhance its space strategy, the Chinese Army formed the Strategic Support Force in 2015, tasked with overseeing crucial elements of the PLA's space missions (Pollpeter, 2020).

The notion of an Asian space race has garnered considerable attention, and it can be argued that India's shift in space policy towards exploration is partly driven by a desire to elevate its international prestige, especially in comparison to Beijing. Meanwhile, Beijing's progress in space technology presents a challenge to New Delhi's leadership in the region. This is particularly relevant as more South Asian nations acknowledge the advantages of space technology, reflecting a broader trend seen among the aspirant countries of South Asia. However, it is crucial to recognize the varying levels of space capabilities, cooperation, and objectives across South Asia, which align with the region's inherent diversity (Stroikos, 2024).

Theoretical Framework

The theoretical framework serves as the conceptual foundation that underpins the study or research endeavors providing a systematic and organized structure for understanding, organizing, and interpreting the phenomenon under investigation (Imenda, 2014).

Neo-Realism

Neorealism also known as structural realism is a prominent international theory that emerged in the 20th century notably associated with scholar Kenth Waltz. At its core neo realism seeks to explain the state behavior in international politics by focusing on the structure of the system rather behavior of the individual state. Two key approaches within neo-realism elucidate the state behavior in an anarchic system offensive and defensive approaches. The offensive approach contends that states are inherently insecure due to the lack of a central authority. As a result, states are motivated to maximize their power and capabilities to ensure their survival in a competitive environment (Waltz, 1990).

Application of Neo-Realism

In the realm of US India's Strategic cooperation in space and its implications on China, the application of neo-realism as a theoretical framework provides valuable insights into power dynamics and security considerations among states, particularly in the context of US India and China in space. The analysis of US- India space cooperation and its implications on China is analyzed through the lens of neorealism which unveils the strategic and competitive dynamics in the space domain. In the context of space, this translates into a relentless pursuit of space domination and the development of offensive and defensive capabilities.

US-India Strategic Cooperation in Space through the lens of Offensive Realism

The US-India strategic cooperation in space can be understood through the framework of offensive realism, which asserts that states are inherently power-seeking and driven by the need to ensure their security in an anarchic international system. From this perspective, the collaboration between the US and India in space represents a strategic effort to counteract China's expanding influence in

the region. By advancing their space capabilities and strengthening technological and military cooperation, the US and India aim to project power and deter potential adversaries. This partnership sends a clear signal to China, indicating that any attempts to dominate space or establish regional hegemony will be met with strong opposition. As a result, the US-India space partnership intensifies the security dilemma for China and potentially leads to an arms race and increased instability in the region as these states seek to enhance their own strategic capabilities.

Chinese Response through the Lens of Defensive Realism

Defensive realism, a theory in international relations, posits that states prioritize security and aim to preserve the status quo rather than expanding their power aggressively. Applying this theory to the implications of Washington-New Delhi's strategic cooperation in space for Beijing, as it is likely to perceive this collaboration as a threat to its security and regional stability. As the US and India enhance their space capabilities and partnership, China may interpret these actions as a strategic effort to counter their influence. In response, China might bolster its own space programs and seek new alliances to mitigate the perceived threat. For China, this could mean accelerating advancements in space technology and strengthening ties with Russia. This scenario exemplifies the defensive realist perspective that states, driven by security concerns, engage in balancing behaviors to maintain equilibrium and deter potential adversaries in an increasingly competitive strategic environment.

Flowchart: US-India and Chinese Space Cooperation Through Realist Lenses

US-India Strategic Cooperation (Offensive Realism Perspective)	Chinese Space Cooperation (Defensive Realism Perspective)
Motivations	Motivations
Maximize power & influence in space	Preserve security balance
Counterbalance China	Defensive posture against US-India
Technological superiority	Surveillance & communication enhancements
Actions	Actions
Joint missions & satellite launches	Joint satellite projects
Space security & defense collaboration	Space research cooperation
Tech transfer & information sharing	Dual-use tech development
	Regional Security Implications
	Heightened competition
	Balance of power in space
	Potential for cooperation or conflict|

Sino-US Rivalry for Space Ascendency

In 2011, the United States altered its approach in response to growing concerns over China's advancements. President Obama referred to this shift as a "Second Sputnik" moment, emphasizing that China was surpassing the U.S. in areas such as energy, computing, and artificial intelligence. At the same time, tensions in Congress escalated over issues like Beijing's ethical considerations regarding tech manufacturing and state patronization of minority abuses. Congressman Frank Wolf from Virginia, who claimed his personal computer had been hacked by Chinese sources, introduced legislative amendments to tighten restrictions on U.S. government interactions with China, including executive initiatives like Bolden's visit (Roll, 2023).

The United States holds advanced space technology that outpaces that of any other country, allowing it the assurance to move away from relying on Chinese technology. As a result, the U.S. is focused on reforming existing regulations and

creating new frameworks to relax the current constraints on space commerce (Qisong, 2023)

In contrast, China's modernization is a counter-planning to Washington's efforts to shape the global order as per its values and rules. On the contrary, the U.S. views Beijing as the only competitor with the ambition and increasing economic, diplomatic, military, and technological capabilities to contest and possibly reshape the current international system (House, 2022) Over the past few decades, Chinese analysts have closely observed the United States' reliance on space, estimating that 70–90 percent of U.S. military intelligence and 80 percent of its communications depend on space-based systems. Acknowledging this dependence, Chinese military strategists have inferred that disrupting U.S. access to space assets could severely impair the military's capacity to succeed in a conflict (White, 2021).

China's increasing reliance on space-based systems for intelligence gathering and navigation highlights the critical importance of space in supporting its anti-access/area-denial (A2/AD) strategy. The Chinese Army leverages these systems to monitor and engage targets on the ground and at sea, providing vital targeting data to its naval, air, and missile forces. By using advanced intelligence, surveillance, and reconnaissance (ISR) satellites, the PLA can coordinate precise missile strikes with systems such as the DF-21D and CJ-10 (both with operational ranges of around 1,500 kilometers) as well as the DF-26, which has an extended range of up to 4,000 kilometers. These capabilities enable China to project power and launch strategic strikes across vast regions, including the western Pacific, Indian Ocean, and South China Sea. Furthermore, Beijing's ongoing advancements in anti-satellite technologies, along with its ability to launch cyber and kinetic attacks against U.S. ground-based C4ISR infrastructure, pose a significant challenge to U.S. military operations in these theaters, potentially disrupting force deployments and reducing mission effectiveness.

China's growing dependence on space-based intelligence and navigation systems for executing long-range strikes and asserting control in space underscores the essential role of space in its anti-access/area-denial (A2/AD) strategy. The Chinese Army utilizes these capabilities to track and target both land and maritime assets, supplying critical targeting intelligence to its naval, air, and missile forces. Through advanced space-based intelligence, surveillance, and reconnaissance (ISR), the PLA can effectively coordinate missile strikes with systems like the DF-21D and CJ-10 (both with a range of 1,500 kilometers) and the DF-26 (with a range of 4,000 kilometers), enabling strikes on targets in the western Pacific, Indian Ocean, and South China Sea. Moreover, China's advancements in anti-satellite weaponry, alongside cyber and kinetic strikes on U.S. ground-based C4ISR systems, present a serious threat to U.S. military operations in the region, potentially impairing force deployment and mission effectiveness (Pollpeter, 2020).

As China advances its space and counter-space capabilities, U.S. officials continue to regard the country as a major counter-space threat. China's kinetic anti-satellite (ASAT) capabilities, notably showcased in the 2007 test that generated significant debris, remain a cause for concern. In addition to that, China has conducted several non-intercept tests in the following years. Demonstrations of co-orbital technology highlight China's ability to maneuver satellites in geostationary orbit (GEO), which, while not explicitly counter-space weapon tests, indicate the potential for co-orbital attacks. Meanwhile, non-kinetic counter-space weapons, such as high-powered lasers or microwave systems, are largely classified or have not been publicly confirmed to have undergone testing (Bingen, 2023).

For the United States, China has now emerged as a formidable peer competitor, acting as a challenger, rival, and adversary, poised to take advantage of the current geopolitical climate to replace the US as the dominant power in Asia and eventually on the global stage. The presence of the so-called "China threat" has become increasingly visible across Asia during the pandemic, including in the South China Sea, East China Sea, Taiwan, Hong Kong, and most notably along the Himalayan border with India, where Indian forces successfully resisted Chinese incursions in Eastern Ladakh. These developments have prompted a strong response from the US, which has openly confronted China, strengthening the determination of some regional powers to unite against Beijing's assertiveness. As these tensions continue, there is growing anticipation and concern about how US policy toward China will evolve under President Biden's leadership (Ahuja, 2021).

The concept of order serves as a framework for stability, offering political value over a specific timeframe. In this context, politics involves the effort to establish and preserve order, enabling control over future developments. Power is defined as the capacity to create this order and transform resources into exclusive assets, thereby ensuring long-term survival (Qisong, 2023).

Table 1

Here is a contrasting table of the space budgets for the USA, India, and China

Country	Space Budget (Latest Available Year)	Percentage of GDP	Key Space Agency
USA	$24.041 billion (NASA, 2024)	~0.10%	NASA
China	$13.3 billion (2022 estimate)	~0.06%	CNSA
India	$1.6 billion (ISRO, 2023-2024)	~0.05%	ISRO

Source: NASA. (2024). NASA Budget. *Retrieved from NASA website*

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Conclusion

The expanding US-India strategic cooperation in space marks a pivotal partnership with significant regional and global implications for China. This collaboration drives technological and scientific progress, enhancing both nations' capabilities in space exploration, satellite technology, and defense. For China, this alliance poses a considerable challenge, as it unites two influential democracies in countering its expanding influence in space and geopolitical spheres. As a result, Beijing may intensify its space initiatives and fortify its strategic alliances. In summary, the US-India space collaboration not only promotes shared interests in scientific and technological fields but also redefines strategic alignments, necessitating significant adjustments in China's policies and alliances.

Discussion

The expanding US-India strategic cooperation is igniting concerns about a new cold war in space. This collaboration raises the possibility of the nuclearization of space, a development that could have significant global implications. For China, this growing alliance presents a considerable challenge, potentially prompting Beijing to intensify its space initiatives and strengthen its strategic partnerships. The US-India partnership has the potential to destabilize the balance of power in the region, tipping it in favor of India.

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