

China's Increasing Space Power and India–China Orbital Competitions

Implications in the Indo-Pacific with a Focus on South Asia

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Abstract

The space race reflects terrestrial geopolitical anxieties, with the Indo-Pacific witnessing an extension of its rivalries into space. India and China, prominent players in this arena, showcase terrestrial conflicts influencing their space strategies. China, evident through projects like the Belt and Road Initiative in South Asia, emphasizes its strategic space policy. India, although lacking a dedicated space force like China, has established itself regionally. Both nations possess antisatellite capabilities and reject the UN resolution banning antisatellite missile tests. This study investigates China's expanding space influence, raising security concerns in the Indo-Pacific, particularly South Asia. Employing explanatory research, the article explores the geopolitical implications, shedding light on perspectives often overlooked in the context of great-power rivalries: those of smaller aspiring spacefaring nations.

The present space age epitomizes multipolarity, with many new spacefaring countries joining old players in the race.¹ However, more actors' space exploitation involvement could increase disagreements over legal principles and global commons rights, intensifying the geopolitical environment and outer-space politics.² The Indo-Pacific space race presents a complex scenario of a growing astropolitical bloc.³

This study examines China's growing space power and its security implications for the Indo-Pacific, particularly South Asian countries. During the initial space age, both China and India were space aspirants who avoided the space race. However, China's space program took a military turn, while India remained focused on

¹ Rajeswari Pillai Rajagopalan and Abhijnan Rej, "Space crisis in a multipolar world: lessons from a simulation exercise," *ORF*, February 2018, <https://www.orfonline.org/>.

² Saadia M. Pekkanen, "Governing the New Space Race," *American Journal of International Law* 113, 1 April 2019, 92–97, <https://doi.org/>.

³ Nadir Ali, "Spacepower in the Indo-Pacific Region," *The Geopolitics*, 12 April 2023, <https://thegeopolitics.com/>.

civilian needs until China's antisatellite (ASAT) test in 2007 prompted a shift.⁴ New Delhi recognized the importance of countering Chinese capabilities in space, aligning with India's evolving regional and global environment.⁵

The militarization and weaponization of space have historical roots, with major powers like the United States, Russia, China, and India demonstrating counterspace abilities through antisatellite weapon tests.⁶ Additionally, countries like Japan, the United Kingdom, Australia, France, Iran, South Korea, and North Korea are investing in such capabilities. China's approach to developing counterspace capabilities raises concerns for the Indo-Pacific region and the global environment. This arms race in space, including direct-ascent, electronic warfare, co-orbital, directed energy, and cyber-attack capabilities, could lead to destabilizing situations.

This expansion of the space arms race further divides the world into technologically superior and inferior states, creating hegemonic powers. The Indo-Pacific region, home to major space-power countries, has historical hostilities that influence regional states' space programs and policies. China and India's space race reflects these dynamics, impacting the growth of smaller space-aspiring South Asian nations.

China's space power extends beyond military pursuits; it also aims to expand territorially through space economy and commercialization strategies.⁷ Future space warfare will likely revolve around exploiting space resources for geo-economic interests.

The study is structured into several sections: Section one discusses the India-China orbital competition within the context of regional geopolitical hostility. Section two explores their involvement in the new space race focused on commercialization and resource exploitation. Section three analyzes China's space strategy and Space Silk Road initiative in South Asia. Section four delves into China's offensive and hard-power strategy in space. Section five examines how India's space policy doctrine reflects regional rivalry. Section six discusses why the

⁴ Rosita Dellios, "China's Space Program: A Strategic and Political Analysis," *Culture Mandala: The Bulletin of the Centre for East-West Cultural and Economic Studies* 7, no. 1 (December 2005), 1–15, <https://silo.tips/>.

⁵ "Challenges to Security in Space," Defense Intelligence Agency, January 2019, 7–28, <https://aerospace.csis.org/>; and Shahid Hussain and Khurram Shahzad, "India's Quest for 'Global Space and Influence' through the 'Outer Space' Domain," *Journal of Space Safety Engineering*, 30 May, 2023, <https://doi.org/>.

⁶ Jakub Pražák, "Dual-use Conundrum: Towards the Weaponization of Outer Space?," *Acta Astronautica* 187 (October 2021): 397–405, <https://doi.org/>; Bledwyn E. Bowen, *Original Sin: Power, Technology and War in Outer Space* (London: Hurst, 2022); and Brian Weeden and Victoria Samson, eds., *Global Counterspace Capabilities: An Open-source Assessment* (Washington, DC: Secure World Foundation, 2023), <https://news.paceeconomy.ca/>.

⁷ Deniel Deudney, *Dark Skies: Space Expansionism, Planetary Geopolitics, and the Ends of Humanity* (New York: Oxford University Press, 2020).

India–China space competition is a concern for South Asian countries. Section seven addresses legal loopholes in space governance and treaties, discussing barriers to space cooperation between the two Asian states. The final section summarizes the study's critical insights, findings, and suggestions.

This research employs explanatory research methods to shed light on China's growing influence in outer space, encompassing militarization, weaponization, and commercialization. It seeks to highlight the geopolitical dimensions of China's astropolitical engagement, often overshadowed by great-power rivalries. The extension of geopolitics into space aligns with Everett C. Dolman's *astropolitik* theory, which posits that space dominance leads to earthly conquest, a principle evident in China's space endeavors despite its official commitment to maintaining space as a peaceful global commons.⁸

Extension of Geopolitical Hostility into Space: India–China Orbital Competition Status

The astropolitical dimension of India–China relations stems from broader geopolitical considerations and security concerns. Given their history of confrontations on land and sea, it is not surprising that these Asian giants might extend their rivalry into outer space. Before delving into the current orbital competitions between India and China, it is essential to understand why this astropolitical rivalry is intertwined with regional and global power struggles.⁹ The China-India rivalry is inherently geopolitical and strategic, further exacerbated by factors like China's close ties with Pakistan and its increasing presence in the Indian Ocean region.¹⁰ Conversely, India has strengthened its relationships with China's rivals like the USA and other Indo-Pacific nations to counterbalance China's influence. These developments have fueled mutual caution and competition in the region.

India is acutely aware of the growing threat posed by China's expanding geopolitical influence in the Indian Ocean region and South Asia. China's presence and actions have become central topics of discussion in numerous multilateral forums, particularly those involving India and the Quad (Quadrilateral Security Dialogue) countries.

For instance, at a recent G-7 summit, member nations openly criticized China's actions. Simultaneously, a sideline meeting among Quad countries underscored

⁸ Everett C. Dolman, *Astropolitik: Classical Geopolitics in the Space Age* (Hoboken, NJ: Routledge, 2001).

⁹ Brandon K. Yoder and Kanti Bajpai, "Introduction: Explaining Cooperation and Rivalry in China-India Relations," *Journal of Contemporary China* 32, no. 141 (21 June 2023): 353–68, <https://doi.org/>.

¹⁰ Paul J. Smith, "The Tilting Triangle: Geopolitics of the China–India–Pakistan Relationship," *Comparative Strategy* 32, no. 4 (September 2013), 313–30, <https://doi.org/>.

their collective commitment to “De-risking from China.” This initiative aims to impose restrictions on Chinese technology enterprises. Additionally, India asserted its stance against “any unilateral attempt to change the status quo” in the Indo-Pacific region.¹¹ It is evident that these discussions and actions reflect the growing concerns among Quad countries regarding China’s activities.

Terrestrial conflicts between these Asian giants have intensified, impacting the overall regional dynamics and power struggles in the Indo-Pacific. Recent incidents, including military confrontations at Dokhlam (2017), Galwan Valley (2020), and clashes in the Taiwan Sector (2022), have had enduring effects on the region. These rivalries have extended beyond land borders and are actively playing out in the maritime domain of the Indo-Pacific.¹²

China’s persistent militarization of its naval fleet in the Indo-Pacific has raised concerns among regional stakeholders. With 85 percent of China’s oil imports passing through the Indian Ocean and the Straits of Malacca, this maritime route is vital to both China’s and India’s economic and security interests.¹³ China’s ambitious Maritime Silk Road initiative, covering the Indian Ocean, the Bay of Bengal, and the Arabian Sea, along with efforts to influence Bay of Bengal littoral states through the Bangladesh-China-India-Myanmar Corridor (BCIM) initiative, have heightened tensions.¹⁴

China’s role as a major military equipment supplier in South Asia has notable implications for regional security dynamics. A recent example is Bangladesh’s inauguration of a six-slot submarine named BNS *Sheikh Hasina* in Cox’s Bazaar. China’s People’s Liberation Army Navy managed the submarine project. This development is of particular concern to India, as it represents an enhancement of Bangladesh’s naval capabilities with Chinese support.¹⁵

Furthermore, China’s deployment of the dual-use DF-26 intermediate-range ballistic missile is a matter of strategic significance. This missile system has the capability for both conventional and nuclear strikes and has a range of approximately

¹¹ Keshav Padmanbhan, “PM Modi, G7 & Quad Outline Strong Stance against China. Beijing Lodges ‘Stern Representations,’” *The Print*, 21 May 2023, <https://theprint.in/>.

¹² Sameer P. Lalwani, Daniel Markey, and Vikram J. Singh, “Another Clash on the India-China Border Underscores Risk of Militarization,” *United States Institute of Peace*, 20 December 2022, <https://www.usip.org/>.

¹³ Chien-peng Chung, “What Are the Strategic and Economic Implications for South Asia of China’s Maritime Silk Road initiative?,” *Pacific Review* 31, no. 3 (2018): 315–32, <https://doi.org/>.

¹⁴ Mohd Aminul Karim and Faria Islam, “Bangladesh-China-India-Myanmar (BCIM) Economic Corridor: Challenges and Prospects,” *Korean Journal of Defense Analysis* 30, no.2 (June 2018): 283–302, <https://digitalarchive.worldfishcenter.org/>.

¹⁵ Seshadri Chari “China’s Arms Game with Bangladesh Getting Dangerous. BNS Sheikh Hasina Is Just a Start,” *The Print*, 7 April 2023, <https://theprint.in/>.

4,023 kilometers. It can conduct precision strikes on surface combatants far from the Chinese coast, posing a potential threat to a wide area.

The missile's range encompasses the central region and the entire eastern coast of India, as well as key strategic points like the Straits of Malacca and Guam in the Pacific Ocean. These capabilities underscore China's efforts to extend its influence and project power across a vast expanse, which has implications for regional security dynamics and strategic considerations, particularly in the Indo-Pacific region.¹⁶

China's Belt and Road Initiative (BRI) has led to significant infrastructure developments with strategic implications in the Indo-Pacific region. One notable project is the construction of the Hambantota port in Sri Lanka, which commenced in 2017. However, Sri Lanka faced challenges in making payments for the port, ultimately resulting in the port being handed over to China on a 99-year lease. The geostrategic location of the Hambantota port is of particular concern due to its proximity to the main sea lane of the Maritime Silk Road (MSR) in the Indian Ocean, linking the Straits of Malacca to China.¹⁷ While the port is currently used for commercial purposes, there are concerns that it could serve military or naval purposes in the future, potentially impacting regional dynamics.

China's involvement in the MSR also includes the construction of the largest deepwater seaport at Gwadar in Pakistan. In contrast, India has pursued its strategic interests in the region by establishing the Chabahar Port in Iran, situated on the Gulf of Oman. This project is part of an India–Iran–Afghanistan partnership and is aimed at containing Chinese expansion in the region.¹⁸

Furthermore, India has undertaken several initiatives, such as Project Mausam in 2014 and Sagarmala in 2019, to enhance its maritime presence and influence in the Indian Ocean region. India has also engaged in institutional forums like the Indian Ocean Rim Association (IORA) and the Pacific Islands Forum (PIF) to assert its position and mitigate China's growing dominance in the maritime domain.¹⁹ These developments reflect the complex and evolving geopolitical compe-

¹⁶ Thangavel K. Balasubramaniam and Ashok Kumar Murugesan, "China's Rising Missile and Naval Capabilities in the Indo-Pacific Region," *Journal of Indo-Pacific Affairs* 3, no. 2 (Summer 2020): 98–111, <https://media.defense.gov/>.

¹⁷ Anu Anwar, "South Asia and China's Belt and Road Initiative: Security Implications and Ways Forward," in *Hindsight, Insight, Foresight, Thinking About Security in the Indo-Pacific*, ed. Alexander L. Vuving (Honolulu: Daniel K. Inouye Asia-Pacific Center for Security Studies, 2020), 161–78, <https://dkiapcss.edu/>.

¹⁸ Sankalp Gurjar, "The Iran Challenge: Unraveling India's Foreign Policy Dilemma," *Journal of Indo-Pacific Affairs* 6, no. 5 (July–August 2023): 47–60, <https://media.defense.gov/>.

¹⁹ Rudra Prasad Pradhan, Chhavi Rathi, and Suraj Gupta. "Sagarmala & India's Maritime Big Push Approach: Seaports as India's Geo-economic Gateways & Neighbourhood Maritime Lessons," *Journal of the Indian Ocean Region* 18, no. 3 (2022) 1–21, <https://doi.org/>; and Premesha Saha, "The ASEAN, PIF, and

tition in the Indo-Pacific, with India and China actively pursuing strategic interests through infrastructure projects and regional engagement.

China has been actively working on its BRI since 2013, aimed at connecting smaller South Asian countries. Within this initiative, the China-Pakistan-Economic Corridor (CPEC) plays a significant role and aligns with China's vision of regional leadership. It also serves to limit India's influence in the region. China's involvement in South Asia has included not only economic but also military assistance to neighboring countries of India. This strategy appears to be an attempt to contain India within its own region while building strategic partnerships with India's neighbors. India has expressed skepticism about the BRI from its inception, and recent expansions, such as the CPEC project in Afghanistan, have raised concerns about India's sovereignty and security. This concern arises because parts of the connectivity project pass through the Indian state of Jammu & Kashmir, which is under the illegal occupation of Pakistan.²⁰

India maintained a strong presence and influence in Afghanistan before the Taliban's resurgence in Afghanistan, often referred to as "Taliban 2.0." India had invested significantly in various development projects in Afghanistan, including infrastructure, education, and capacity-building initiatives. This presence was part of India's broader strategy to enhance its regional influence and promote stability in Afghanistan.

With the expansion of China's BRI into Afghanistan, it is plausible that China may seek to establish a more significant presence in the country. The BRI focuses on infrastructure development and connectivity projects, and Afghanistan's strategic location in South Asia makes it an attractive target for Chinese investment and influence. This expansion could include the construction of critical infrastructure and potentially a base or facility to support China's regional interests.

The evolving situation in Afghanistan, including political developments and security concerns, will play a crucial role in shaping China's engagement in the country. It is essential to monitor these developments to understand the extent of China's involvement in Afghanistan and its potential impact on regional dynamics and geopolitics.

These developments in the realms of land and maritime geopolitics significantly shape the strategies and programs of India and China in the domain of outer space. China's increasing militarization of space aligns with Xi Jinping's "Grand Strategy,"

IORA Drive the Agenda of the Quad Leaders' Meeting in Hiroshima," *Observer Research Foundation*, 25 May 2023, <https://www.orfonline.org/>.

²⁰ Press Trust of India, "Pakistan, China agree to extend CPEC Afghanistan; Stress on Combating Terrorism," *Economic Times*, 9 May 2023, <https://economictimes.indiatimes.com/>.

as the country launches satellites in both low Earth orbit (LEO) and geosynchronous orbit (GEO) in substantial numbers.²¹ This reflects China's substantial stake in making the space domain congested and contested.²² The Indo-Pacific region stands as one of the most contested and challenged areas globally, with India and China holding significant stakes in its dynamics. Due to geographical proximity, historical ties, and cultural affiliations, South Asian countries have often found themselves caught in regional rivalries. Both India and China are actively seeking to enhance their regional power and dominance through their space capabilities. The status of outer space as a global commons has been compromised by the arms race, leading to astropolitical rivalries.²³

Intensely, both Asian powers have developed counterspace technologies, raising concerns about the potential for space warfare. The importance of space technologies is rapidly growing, extending beyond state actors to include various players. The most concerning aspect of space technologies is their capacity to change the dynamics of warfare. This has become even more apparent following the Russian invasion of Ukraine, where Starlink satellite services played a critical role in enabling the Ukrainian military to maintain control.²⁴

In conclusion, this study focuses on the two prominent space actors in Asia, China and India, which have become increasingly adversarial across various fronts. Their rivalry has expanded from the maritime and geopolitical dimensions into the realm of outer space.²⁵ Both countries have integrated hard-power and soft-power strategies into their space programs, which influence regional orders and power dynamics in the Indo-Pacific and South Asia. The absence of space cooperation between these Asian giants presents challenges for smaller countries aspiring to develop their space capabilities.

Space technology plays a pivotal role in both hard- and soft-power strategies for countries.²⁶ Nations utilize space diplomacy, offer space technological cooperation, and provide data-sharing opportunities to aspiring and nonpacefaring

²¹ Namrata Goswami, "China's Grand Strategy in Outer Space: To Establish Compelling Standards of Behavior," *Space Review*, 5 August 2019, <https://www.thespacereview.com/>.

²² Kevin Pollpeter, "China's Role in Making Outer-space More Congested, Contested, and Competitive," China Aerospace Studies Institute, October 2021, <https://www.airuniversity.af.edu/>.

²³ Julie Michelle Klinger, "Critical Geopolitics of Outer Space," *Geopolitics* 26, no. 3 (4 November 2020): 661–65, <https://doi.org/>; and Pražák, "Dual-use Conundrum."

²⁴ Timothy Goines, Jeffrey Biller, and Jeremy Grunert, "The Russia-Ukraine War and the Space Domain," *Articles of War* (blog), 14 March 2022, <https://lieber.westpoint.edu/>.

²⁵ Rajeswari Pillai Rajagopalan, "Space Security in the Indo-Pacific," *Air and Space Law* 48, Special Issue (2023): 59–74, <https://doi.org/>.

²⁶ Pinar Bilgin and Berivan Eliş, "Hard Power, Soft Power: Toward a More Realistic Power Analysis," *Insight Turkey* 10, no. 2 (2008): 5–20, <https://www.jstor.org/>.

states as tools to advance their geopolitical interests and assert their influence on the world stage. Both China and India have harnessed space technology to bolster their positions in the region.

China, in particular, has demonstrated a strong commitment to developing counterspace capabilities as part of its national security strategy.²⁷ The militarization of space by China represents a significant manifestation of its hard-power strategy. China's ambitions in space are intimately linked with its terrestrial politics and broader grand strategy. The goal is clear: China aspires to become a global and regional leader by establishing dominance in space affairs. Moreover, the Chinese government is actively promoting its "Space Silk Road" policy on a global scale, extending its influence not only in Asia but also in Africa and other regions.

India, in response to China's actions in the South China Sea and its stance on Taiwan, is undergoing a notable shift in its space strategy.²⁸ This shift is characterized by a heightened focus on space capabilities and technology. India recognizes that outer space is not an isolated frontier; rather, it is intricately connected to global politics and the prevailing world order. As such, it acknowledges the increasing importance of planetary capabilities and space powers in shaping the dynamics of international relations.

In this evolving landscape, the militarization of space and the pursuit of space superiority are integral components of a nation's broader geopolitical ambitions. As both China and India invest in space technologies and capabilities, the implications of their actions extend beyond the cosmos, influencing the global balance of power and order.

India, too, is emerging as a major player in the Indo-Pacific region's space arena. The country initiated its space journey in the early 1960s, with the aim of utilizing space-based technologies for socio-economic development. Over the years, India has made significant strides in space technology. It launched its first satellite in 1963 and subsequently developed its first indigenous satellite, RohiniRS-1, in the 1980s. India's military has achieved indigenous missile defense and long-range ballistic missile capabilities, with the potential for direct-ascent antisatellite (DA-ASAT) capabilities. In 2019, India demonstrated its ASAT capability by destroying one of its satellites. India has also established a space situational awareness (SSA) program to monitor space security threats. This program enhances India's ability to protect its space assets.

²⁷ Weeden and Samson, eds., *Global Counterspace Capabilities*.

²⁸ Harsh V. Pant and Suyash Desai, "India Must Make the Most of China-Taiwan Conflict—Change LAC Status Quo, Fight Beijing Better," *The Print*, 2023, <https://theprint.in/>.

India's ASAT test was undoubtedly a response to China's ASAT capabilities. Prime Minister Modi emphasized the significance of this achievement, highlighting India's capacity to defend not only on land, water, and air but also in space. Interestingly, India's pursuit of indigenous satellite technology began after the 1962 war, indicating its awareness of China's intentions in the realm of military space capabilities. In response to China's announcement of sending a human into orbit in 2003, India launched its first lunar mission, Chandrayaan-1, in 2008. Although the second lunar mission in 2019 faced technical challenges resulting in the lander's crash on the Moon's southern hemisphere, India did not waver in its space ambitions. On 14 July 2023, India launched its third lunar mission, Chandrayaan-3, which achieved a successful landing on the lunar south pole. This milestone not only represents a significant scientific accomplishment for India but also a strategic victory in the lunar competition. India stands as the fourth lunar-capable nation, uniquely distinguished by its ability to achieve a soft landing on the lunar pole's dark side. The success of the Chandrayaan-3 mission has far-reaching implications for lunar resource endeavors. While India is a relatively new entrant in lunar exploration compared to established players like the United States, Russia, and China, it has outperformed all in reaching the elusive south pole. Following Russia's setback in the Luna-25 mission, India has unmistakably emerged as the world's rising lunar power.²⁹

The evolving nature of the world order has reintroduced outer space as the “ultimate high ground.”³⁰ The conflict between Russia and Ukraine provides a telling example of how terrestrial conflicts can extend into space. Initially, the Russian government successfully jammed Ukrainian and European satellite communications (SATCOM) terminals.³¹ However, Ukraine received crucial space technological support from its allies, including the European Union and the United States, with Starlink's contribution significantly altering the dynamics of the conflict.

China, following Russia's lead, also criticized SpaceX's involvement in military activities and announced its intent to counter such participation. These develop-

²⁹ “Chandrayaan 2,” Indian Space Research Organization, Department of Space, 22 July 2019, <https://www.isro.gov.in/>; Chethan Kumar, “Chandrayaan-3 Launch on July 14; August 23–24 Preferred Landing Dates,” *Times of India*, 6 July 2023, <https://timesofindia.indiatimes.com/>; Michael Kugelman, “India's Moon Landing Is a Big Geopolitical Step,” *Foreign Policy*, August 23 2023, <https://foreignpolicy.com/>; and Amitabh Sinha, “Russia's First Moon Mission in Decades Fails as Luna-25 Crashes into Lunar Surface; All Eyes on Chandrayaan-3 Now,” *Indian Express*, 23 August 2023, <https://indianexpress.com/>.

³⁰ Gregory J. Meyer and Francis P. Stallings. “Is Space the Ultimate High Ground?,” *Proceedings of SPIE* 4, no. 8044 (May 2011): 184–91, <https://doi.org/>.

³¹ Kartik Bommakanti, “Starlink and Ukrainian Military Performance: Implications for India,” *Observer Research Foundation*, 2 June 2022, <https://www.orfonline.org/>.

ments underscore the interconnectedness of terrestrial disputes and space activities, raising the possibility that China and India's disputed territorial issues may spill over into space-related conflicts.

In the broader context of the Indo-Pacific region, power rivalries have assumed critical importance. The United States has long held a dominant position in the region, while China and India are emerging as significant actors. The current power struggle has created a trilemma equation involving the United States, China, and India, shaping the dynamics of the Indo-Pacific area. This strategic competition extends to China's rivalry with Quad countries, casting a shadow over the small countries of South Asia. These power dynamics continue to evolve and have far-reaching implications for the region and beyond.

Race for Commercialization

Increasing private-actor involvement in space exploration has ushered in a new, exploitation-driven space race.³² China, despite being an authoritarian state, exercises complete control over its private actors and actively promotes commercialization in space. Chinese private space companies are engaged in the development of reusable rockets, satellite and sensing technologies, and advanced rocketry systems. For instance, China's commercial space industry achieved a milestone with the successful launch of its CERES-1 rocket in 2020, capable of carrying 770 pounds of payload into LEO.³³ China is strategically bolstering its private space industries to counter the dominance of US commercial actors in space. The growth of China's private space market gained momentum after 2016, with the Institute for Defence Analyses reporting the existence of 78 commercial space companies. In China's commercial space sector, mixed-ownership enterprises like Zhuhai Orbital, Expace, and OK-Space provide services such as remote sensing, launch capabilities, and communication services. Many of these private actors have the potential to serve both civilian and military purposes, aligning with China's emphasis on *civil-military integration*, denoting the leveraging of dual-use technologies, policies, and organizations for military advantage.³⁴

³² Pekkanen, "Governing the New Space Race"; and James Clay Moltz, "The Changing Dynamics of Twenty-first-century Space Power," *Strategic Security Quarterly* 12, no. 1 (Spring 2019):15–43, <https://www.airuniversity.af.edu/>.

³³ Andrew Jones, "Chinese Rocket Firm Galactic Energy Succeeds with First Orbital Launch, Secures Funding," *Space News*, 7 November 2020, <https://spacenews.com/>.

³⁴ Irina Liu et al., *Evaluation of China's Commercial Space Sector* (Washington, DC: Institute for Defense Analyses, September 2019), <https://newspaceeconomy.ca/>.

India has also enthusiastically entered the fray, recently unveiling its space policy on April 20, 2023. The country's policy prioritizes the commercialization of launch and space-related activities for civilian purposes. This shift began in 2019 with the establishment of "New Space India Limited Company."³⁵ India draws inspiration from the United States' *National Space Policy* and the Commercial Space Launch Competitiveness Act (CSLCA) of 2015.³⁶ India currently leads the way with forward-looking private space companies such as Agnikul Cosmos, Skyroot Aerospace, and Pixxel. In 2022, Skyroot Aerospace achieved a significant milestone by launching its first private rocket. Moreover, the company has set ambitious goals, pledging to launch its second satellite by 2023, with a strategic plan to conduct a minimum of two rocket launches annually starting in 2024.³⁷

India currently contributes 2 percent to the global space market and has ambitious plans to increase this contribution to 9 percent by 2023.³⁸ In line with this vision, Sreedhara Panicker Somanath, chairman, Indian Space Research Organisation (ISRO), reports that 100 startup companies have registered with ISRO, with 10 private space companies actively engaged in rocket and satellite development.³⁹ The Indian government's decision to remove Goods & Services Tax (GST) barriers for satellite launches by private actors has provided a significant boost to the Indian private space industry.⁴⁰ India joined the Artemis Accord on 21 June 2023, further solidifying its strategic ties and commitment to enhancing space cooperation with the United States in the endeavor to return humans to the Moon by 2025.⁴¹

³⁵ Susmita Mohanty, "NewSpace India and Indian National Space Promotion and Authorization Centre: A Fledgling and Critical Partnership," *New Space* 10, no. 1 (March 2022): 3–13, <http://doi.org/>.

³⁶ P.J. Blount and Christian J. Robison, "One Small Step: The Impact of the US Commercial Space Launch Competitiveness Act of 2015 on the Exploitation of Resources in Outer Space," *North Carolina Journal of Law & Technology* 18, no. 2 (2016): 160–86, <https://scholarship.law.unc.edu/>.

³⁷ Nivedita Bhattacharjee, "India's First Private Rocket Company Looks to Slash Satellite Costs," *Reuters*, 26 November 2022, <https://www.reuters.com/>; Rishika Sadam, "India's Skyrooot Expects to Double Rocket Launches amid Chandrayaan-3's Success," *Reuters*, 29 August 2023, <https://www.reuters.com/>.

³⁸ "Enhancing the Private Participation in Space Activities," Indian Space Research Organisation, March 2023, <https://static.pib.gov.in/>.

³⁹ "About 100 Start-ups Registered with ISRO, says Chairman S Somanath," *Business Standard*, 17 November 2023, <https://www.business-standard.com/>.

⁴⁰ Press Trust of India, "Space Startups, Industry Bodies Welcome GST Exemption for Satellite Launch Services," *Economic Times*, 12 July 2023, <https://economictimes.indiatimes.com/>.

⁴¹ "The Republic of India Signs the Artemis Accord" (press release, US Department of State, 24 June 2023), <https://www.state.gov/>.

The Economic Implications of Space Militarization and Resource Exploitation

The availability of rare-earth resources is inherently limited, leading countries to look toward new, unowned territories such as the Moon or Mars as potential sources of these valuable materials. Namrata Goswami and Peter Garretson have already outlined how space could become a contested domain among space powers, primarily driven by resource competition.⁴² Examining current trade war dynamics, it becomes evident that rare-earth elements (REE) have played a pivotal role in the trade tensions between the United States and China. The United States heavily relies on China for REE supplies, with approximately 80 percent of such imports originating from China. These REEs are crucial in the manufacturing of cell phones, military equipment, and batteries for electric cars, underscoring their strategic importance. In response to US sanctions, China imposed export restrictions on gallium and germanium starting from 1 August 2023, with germanium being a vital component in computer chip production.⁴³ China has justified these sanctions as measures to safeguard its national interests.⁴⁴

This section delves into the connection between space militarization and resource exploitation, exploring its implications. The trajectory of militarization in space is no longer solely focused on protecting space assets or countering adversaries in space; it has expanded to include resource acquisition. Historical precedents of expansionism highlight how major powers have consistently sought to colonize or control specific regions of the world to secure access to vital energy resources. Classical geopolitics theories like Rimland and Heartland have long emphasized the significance of geography and natural resources in shaping global power dynamics.

Both the United States and China have ambitious lunar exploration plans, with the United States aiming to establish a permanent Moon base by 2030 and launching the Artemis Accord in 2020, garnering support from 21 countries, including India. China has also declared its intent to establish a nuclear-powered facility on the Moon by 2028.⁴⁵ India is actively pursuing lunar exploration, and if its third Moon mission proves successful, it will join the ranks of lunar-capable nations.

⁴² Namrata Goswami and Peter A. Garretson. *Scramble for the Skies: The Great Power Competition to Control the Resources of Outer Space* (Lanham, MD: Lexington Books, 2020).

⁴³ Archie Hunter and Alfred Cang, "China Restricts Export of Chipmaking Metals in Clash with US," *Bloomberg*, 3 July 2023, <https://www.bloomberg.com/>.

⁴⁴ Mai Nguyen, "China's Rare Earths Dominance in Focus after It Limits Germanium and Gallium Exports," *Reuters*, 5 July 2023, <https://www.reuters.com/>.

⁴⁵ Sakshi Tiwari, "China Could Set Up 'Moon Base' By 2028; Lunar Station Likely to Be Powered by Nuclear Energy—Chief Designer," *EurAsian Times*, 23 November 2023, <https://www.eurasiantimes.com/>.

These initiatives are accompanied by legal changes that potentially conflict with existing space laws and treaty clauses.

For example, Article 1 and Article 2 of the Outer Space Treaty (OST) clash with the US SPACE Act of 2015, which provides for unfettered exploitation of space resources, and Luxembourg's Law on the Exploration and Use of Space Resources (2017), which pertains to the right to mine extraterrestrial property. These discrepancies challenge the credibility of established space norms. Consequently, there exists a potential for conflict as multiple countries vie for lunar and Martian resources, with the first nation capable of exploiting and occupying these space resources likely gaining a significant advantage in this emerging frontier.

China's Space Strategy and Space Silk Road Policy: Execution in South Asia

China initiated its space program in the 1950s and gradually evolved into a prominent spacefaring nation, achieving this status through advancements in military technology. The nation has set its sights on becoming a global leader in space exploration by 2045. However, China faced exclusion from the International Space Station in 2011, prompting the development of its first independent Tian-gong space station, completed in 2022.⁴⁶ China's ambitious plan to establish itself as a major space power by 2030 is evident in various initiatives, including the Mars mission launched in 2021 and plans for a crewed lunar mission by 2036. China also laid the foundation for its space endeavors with the establishment of the Space Systems Framework (SSF) in 2015, signifying its intent to maintain control over other space actors' activities.⁴⁷

China's space strategy can be delineated into two distinct aspects: a soft-power strategy and an offensive hard-power strategy. On one front, China is diligently building its space-related hard-power capabilities, with a rapid expansion of its space expansionism efforts encompassing celestial and celestial body exploration. Simultaneously, China seeks global popularity through its space-cooperation policy.

Many countries may initially perceive China's space initiatives as science and technological cooperation, but these endeavors carry long-term implications, particularly when considering regional dynamics within the Indo-Pacific. China established the Asia-Pacific Space Cooperation Organization (APSCO) in 2008 to foster collaboration with Asia-Pacific nations in areas such as data sharing, disaster monitoring, ground infrastructure, and connectivity. Notably, two South

⁴⁶ Andrew Jones, "Tiangong Is China's Space Station in Low Earth Orbit," *Space.com*, 24 August 2021, <https://www.space.com/>.

⁴⁷ Larry M. Wortzel, "The Chinese People's Liberation Army and Space Warfare," *Astropolitics* 6, no. 2 (2008): 112–37, <https://doi.org/>.

Asian nations, Bangladesh and Pakistan, are primary members of APSCO.⁴⁸ China further extended its space cooperation under the global BRI by launching the Space Information Corridor (SIC) project in 2016, aimed at enhancing satellite applications and ground systems among member states.⁴⁹ China sells space-related data and technological support to Pakistan and Sri Lanka. Additionally, China has entered into memoranda of understanding with the national space agencies of 46 countries and four international organizations as of 2022.⁵⁰ Furthermore, China has proposed joint research endeavors with Russia focused on the Moon and deep space, with plans to establish the International Lunar Research Station (ILRS) by 2035.⁵¹

According to China's Ministry of Industry and Information Technology, the nation is actively providing space services and data sharing with numerous countries in Asia and Africa through these initiatives.⁵² China's deployment of the Beidou satellite (BDS) system, serving as a global navigation satellite system provider, enables the People's Republic of China (PRC) to exert influence over third-world countries and control satellite navigation service markets. Since 2020, China has been engaged in negotiations with several small South Asian nations, including Pakistan, Nepal, Bangladesh, and Sri Lanka, to encourage the adoption of the BDS navigation system. Initially, Bangladesh and Nepal showed optimism regarding the BDS system, leading China to invite Nepali officials to Beijing for Beidou system training.⁵³ Furthermore, China launched Sri Lanka's inaugural satellite, Supreme Sat I, in 2012, which serves as a communication satellite. However, it is important to note that most South Asian states rely on US-based navigation systems, such as GPS, for their navigation needs.⁵⁴

⁴⁸ Asia-Pacific Space Cooperation Organization (APSCO), "About APSCO," n.d., <http://www.apsco.int/>.

⁴⁹ Mingyan Nie, "Asian Space Cooperation and Asia-Pacific Space Cooperation Organization: An Appraisal of Critical Legal Challenges in the Belt and Road Space Initiative Context," *Space Policy* 47 (February 2019): 224–31, <https://doi.org/>.

⁵⁰ David H. Millner, Stephen Maksim, and Marissa Huhmann "BeiDou: China's GPS Challenger Takes Its Place on the World Stage," *Joint Forces Quarterly* 105, no. 2 (2022): 23–31, <https://ndupress.ndu.edu/>.

⁵¹ Deng Xiaci, "Scientist Reveals Key Objectives for Lunar Station Project Co-proposed by China, Russia," *Global Times*, 22 March 2023, <https://www.globaltimes.cn/>.

⁵² "China Regional Snapshot: Space," Foreign Affairs Committee, 14 November 2022, <https://foreignaffairs.house.gov/>; and "The Beidou Satellite Network and the 'Space Silk Road' in Eurasia," Jamestown Foundation China Brief, July 2020, https://jamestown.org/program/the-beidou-satellite-network-and-the-space-silk-road-in-eurasia/?mc_cid=3629b3ce05&mc_eid=5debcfd568;

⁵³ Ananth Krisnan, "China's Home-grown Beidou Satellite System Eyes Global Footprint," *The Hindu*, 4 November 2022, <https://www.thehindu.com/>.

⁵⁴ Deccan Herald News Service, "China launches Sri Lanka's first Satellite," *Deccan Herald*, 2012, <https://www.deccanherald.com/>.

China's Offensive Hard-Power Strategy: Counterspace Capabilities

Acquiring counterspace power is vital for safeguarding space assets and can also be employed to restrict an adversary's access to space or disrupt and disable their space infrastructure. In this pursuit, China stands at the forefront, actively advancing its counterspace capabilities with global dominance in mind. The implications of China's expanding space military assets, encompassing both conventional and nuclear capabilities, loom large over the Indo-Pacific region. An examination of China's space military doctrine reveals that the People's Liberation Army (PLA) draws inspiration from the successful utilization of space technologies in conflicts like the First Gulf War, Afghanistan, and Iraq. Major General Cai, a prominent advocate for integrated space power within the PLA, asserts that "control of portions of outer space is a natural extension of other forms of territorial control, such as sea or air control."⁵⁵

China's extensive megaconstellation project in LEO and its competitive stance against other spacefaring nations and private entities raise genuine concerns, not only for the realm of space but also for Earth's environment. China has developed sophisticated space technologies capable of conducting radiofrequency jamming against communication satellites in LEO. Moreover, it has actively pursued the creation of a ground-based ASAT missile system designed to target satellites in LEO. Additionally, China possesses ASAT weapons with the capacity to destroy satellites in GEO. According to the 2022 report from the Defense Intelligence Agency (DIA), "PRC is using its intelligence, surveillance, and reconnaissance (ISR) satellite fleet for both military and civilian purposes, including remote sensing and mapping, terrestrial and maritime surveillance, and intelligence collection."⁵⁶ These developments underscore China's commitment to advancing its space-related military capabilities and assertive posture in the global space arena.

India's Space Policy Doctrine: A Reflection of Regional Rivalry

When comparing India and China's space programs, policies, and achievements, it is undeniable that India lags behind China in terms of space development. However, India's approach to space power is unique in many respects. India has set an example by establishing space infrastructure and conducting space missions with a focus on cost-effectiveness and sustainability. Notably, India became the first Asian nation to successfully reach the Mars orbit on its maiden attempt. India has set ambitious goals, including plans to build its own

⁵⁵ Wortzel, "The Chinese People's Liberation Army and Space Warfare."

⁵⁶ "Challenges to Security in Space," Defence Intelligence Agency.

space station by 2030.⁵⁷ Following the Chandrayaan-3 mission, India is gearing up for the Gaganyaan mission, slated for end of 2024, which aims to launch a human spaceflight into LEO.⁵⁸

India's prominence in the global space arena is evident in its extensive international collaborations, boasting over 230 space agreements with 60 countries and five international organizations. India also achieved a world record by launching 104 satellites in a single mission in 2017.⁵⁹ The nation's space policy is primarily guided by the objectives of the ISRO, and it explicitly states that "Non-Governmental Entities (NGEs) shall be allowed to undertake end-to-end activities in the space sector through the establishment and operation of space objects, ground-based assets and related services, such as communication, remote sensing, navigation, etc."⁶⁰

However, India's current threat perception in outer space is largely influenced by China's substantial investment in counterspace capabilities. Additionally, China's assistance to Pakistan in developing kinetic and nonkinetic space weaponry further complicates the regional dynamics. In response, India has intensified efforts to bolster its surveillance and intelligence capabilities using space-based assets to enhance national security. It is worth noting that India currently possesses a rudimentary satellite navigational system, which proved insufficient for monitoring events like the deadly clashes along the Line of Actual Control (LOAC) in the Galwan Valley in Ladakh in 2020.⁶¹ In contrast, China maintains a complex satellite constellation in the LEO and medium-Earth orbit (MEO), providing a significant advantage in the space arena.

Recognizing the evolving military dimension of space activities, India has taken steps toward the establishment of an integrated space force. In 2019, India established the Defence Space Agency (DSA) and the Defence Space Research Organisation (DSRO) to conduct integrated space warfare exercises and develop SSA. DSRO is tasked with the development of space warfare-oriented weapons systems

⁵⁷ Ashmita Rana and Yogesh Joshi, "India-China Space Race: The Role of Private Sector" (working paper, IAS Working Papers, National University of Singapore, 27 December 2021), <https://www.isas.nus.edu.sg/>.

⁵⁸ Sharmila Kuthur, "India to Launches Test of Gaganyaan Crew Capsule's Emergency Escape System This Year," *Space.com*, 19 September 2023, <https://www.space.com/>.

⁵⁹ Prabhjote Gill, "India Has Signed 250 Documents on Space Cooperation with 59 Countries, Says ISRO Chief K Sivan," *Business Insider*, 14 October 2020, <https://www.businessinsider.in/>; and "ISRO Sends 104 Satellites in One Go, Breaks Russia's Record," *Economic Times*, 15 February 2023, <https://economictimes.indiatimes.com/>.

⁶⁰ Adithya A. Variath and Khooshi Mukhi, "Indian Space Policy 2023: India's Space Diplomacy in the Global South," *The Geopolitics*, 27 May 2023, <https://thegeopolitics.com/>.

⁶¹ Anushka Saxena, "India's Space Policy and Counter-Space Capabilities," *Strategic Analysis* 47, no. 2 (2023): 146–58, <https://doi.org/>.

and technologies for India.⁶² Furthermore, India is actively utilizing the Quad as a platform for space cooperation among member countries. The Quad nations expanded their partnership in space, cybersecurity, and emerging technologies in 2021. A new working group was formed to facilitate the exchange of satellite data for climate change, disaster management, and preparedness. The Quad countries also committed to enhancing space-related capacity building and the advancement of space technologies and applications. These efforts highlight India's commitment to advancing its space capabilities and fostering regional and international cooperation in the space domain.⁶³

Status of Small Countries' Space Programs: Why India–China Space Competition Is Anxiety for These Countries

The interests of aspiring spacefaring states have become intertwined with national interests and civil-military complexities.⁶⁴ This section of the paper has highlighted the impact of the India–China race over outer space and analyzed how the given situation can increase the possibility of war in space between space actors and what could be the immediate effect of it for South Asia and in a wide frame in the Indo-Pacific. India's increasing investment in counterspace capacities is a sign of preparing itself for a future war in space.

The South Asian region has already experienced tensions and conflicts, primarily between India and Pakistan, which have hindered the development of strong economic integration due to mutual distrust. Additionally, China has played a significant role as an extraregional influencer in the region. In response to China's growing influence, India and its Indo-Pacific allies have been promoting the Indo-Pacific strategy to counterbalance China's regional dominance. Notably, Bangladesh recently expressed its support for the Indo-Pacific cooperation policy and unveiled its *Indo-Pacific Outlook* (IPO) in April 2023, emphasizing the peaceful use of space and the maritime domain. Bangladesh's engagement with the Indo-Pacific represents a partial victory for the Indo-Pacific alliance, particularly India.⁶⁵

⁶² Saxena, "India's Space Policy and Counter-Space Capabilities."

⁶³ "Quad Leaders' Summit" (fact sheet, The White House, 24 September 2023), <https://www.whitehouse.gov/>; and Mandeep Sing Rai, "Revisiting QUAD's Ambition in the Indo-Pacific Leveraging Space and Cyber Domain," *arXiv preprint arXiv:2209.04609*, 28 September 2022, <https://arxiv.org/>.

⁶⁴ Pekkanen, "Governing the New Space Race."

⁶⁵ Monoar Alim Chowdhury, "Bangladesh's Indo-Pacific Outlook: Tilting, Rebalancing, or Else?," *The Geopolitics*, 24 May 2023, <https://thegeopolitics.com/>.

India holds a prominent position as a major space power among the eight countries with space capabilities, while the other South Asian states are aspiring to develop their own space programs. India's role in space cooperation extends to both the global and regional scales. Initially, India took regional space-cooperation initiatives in 2017 by offering the South Asian Association for Regional Cooperation (SAARC) Satellite, aimed at fostering connectivity throughout the region using space-based satellites and services.⁶⁶ The agenda of building the SAARC satellite was building connectivity throughout the region through space satellites and services. However, this initiative faced challenges due to Pakistan's objections, resulting in a failure to overcome terrestrial conflicts and realize the potential for orbital cooperation.⁶⁷ Despite initial skepticism from other regional states about sharing a single satellite, India's successful space diplomacy and historical ties with its neighbors partly led to the successful launch of the rebranded South Asia Satellite, which primarily serves communication purposes and supports various applications, including internet connectivity, direct-to-home television, tele-education, telemedicine, disaster management, meteorological applications, fishing and agricultural advisory services, and natural resource mapping, among others.⁶⁸ Subsequently, many regional countries, including Bangladesh, Nepal, Sri Lanka, and Bhutan, launched their own satellites or nanosatellites. Even the Maldives initiated a space research program, with India's private companies playing essential roles in assisting these efforts. India directly assisted Bhutan in launching its first nanosatellite, and it also collaborated with Maldives in its space endeavors.⁶⁹

In contrast, Pakistan, another South Asian state that began its space program in 1962, has faced challenges and setbacks, including political, economic, and technological limitations. Pakistan is the only South Asian country that has sought direct assistance from China for its space program.⁷⁰ However, it is challenging for smaller countries in the region to engage in collaboration or seek direct support from Beijing due to the competitive dynamics between China and India in the region.

⁶⁶ K V Venkatasubramanian, "South Asian Satellite to Boost Regional Communication," Special Service and Features, Press Information Bureau Government of India, 7 May 2017, <https://pib.gov.in/>.

⁶⁷ Ajey Lele, "Satellite for SAARC: Pakistan's Missed Opportunity," Manohar Parrikar Institute for Defence Studies and Analyses, 19 April 2016, <https://www.idsa.in/>.

⁶⁸ Shounak Set, "India's Regional Diplomacy Reaches Outer Space," Carnegie India, 3 July 2017, <https://carnegieendowment.org/>; and Farjana Sharmin, "Why South Asia Needs Regional Cooperation on Space Policy?," *South-South Research Initiative*, 8 November 2022, <https://www.ssrinitiative.org/>.

⁶⁹ Ajey Lele, "Space Programs, Policies, and Diplomacy in South Asia," in *Routledge Handbook of the International Relations of South Asia*, ed. Sumit Ganguly and Frank O'Donnell (New York: Routledge, 2022), 454–69.

⁷⁰ Mohammad Ali Zafar and Ayesha Zafar, "Devising National Space Policy In Pakistan," *Aether: A Journal of Strategic Airpower & Spacepower* 1, no. 4 (Winter 2022): 49–62, <https://www.airuniversity.af.edu/>.

Looking at South Asia, there are various regional and subregional initiatives such as the SAARC and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), which have committed to promoting cooperation in scientific innovation and technical collaboration. BIMSTEC has even launched a Technology Transfer Facility (TTF) among member states in 2022, aimed at coordinating and strengthening cooperation in the field of space technology applications.⁷¹ Unfortunately, these regional initiatives have been hampered by the geopolitical rivalries between India and Pakistan, as well as India and China, which have hindered integrated space cooperation in South Asia.

Legal Loopholes: Analyzing the Existing Space Governance and Treaties, and Possibilities of Cooperation

This section underscores the argument that existing space governance has significant gaps and limitations. While the OST of 1967 prohibits the deployment of weapons of mass destruction and nuclear weapons in space, it does not restrict the deployment of conventional weapons. Consequently, four countries have conducted ASAT tests, resulting in a proliferation of space debris. Notably, both China and India refused to sign a recent UN resolution aimed at banning destructive direct-ascent ASAT missile tests.⁷²

The proposal for banning such destructive tests in space was initially introduced by the United States, a major ally and strategic partner of India. However, India chose to adopt an absentia policy in this matter. China's direct opposition to and vote against the UN resolution did not come as a surprise. Therefore, it is evident that both countries prioritize national security through counterspace capabilities. Unfortunately, this mind-set is likely to lead to an increase in the number of ASATs in space.

⁷¹ "Cabinet Approves Memorandum of Association (MOA) by India for Technology Transfer Centre at Colombo, Sri Lanka" (press release, Government of India, 14 June 2022), <https://pib.gov.in/>.

⁷² Jeff Foust, "More Countries Encouraged to Commit to Halt Destructive ASAT Tests," *Space News*, 15 June 2023, <https://spacenews.com/>.

Table 1. Number of debris created by space actors up to February 2022

Russia	7,032
United States	5,216
China	3,854
France	520
Japan	117
India	114
European Space Agency	60
United Kingdom	1

Source: Anna Fleck, Countries Creating the Most Space Debris," Statista, 22 September 2022, <https://www.statista.com/>.

States are no longer the sole actors creating debris. Private actors now bear equal responsibility for rendering the space environment vulnerable. According to a 2022 Australian Space Agency report, a SpaceX capsule piece dropped in Australia.⁷³ Existing international space laws do not explicitly address the debris problem. However, the 1967 OST and the 1972 Liability Convention, which ensures consultations and compensation for damage caused by space objects, could apply to tackling space debris. But the irony is that in 1981, the Soviet Union only agreed to pay Canada USD 3 million for the 1978 disintegration of its Cosmos 954 satellite over Canadian territory.⁷⁴ This remains the last example of any spacefaring state agreeing to pay compensation to date.⁷⁵

In the case of India–China space cooperation, regional power competition is the primary barrier. Although India and China signed a 2014 Memorandum of Understanding to cooperate in keeping space peaceful, it went nowhere.⁷⁶ Ongoing astropolitical rivalries reduce chances for space cooperation. India recently joining the Artemis Accords further complicates lunar competition and space politics. Thus, no bilateral possibility exists currently to build space cooperation between the two Asian space giants.

⁷³ "Space Debris Australia: Piece of SpaceX Capsule Crashes to Earth in Field," *BBC News*, 3 August 2022, <https://www.bbc.com/>.

⁷⁴ "Convention on International Liability for Damage Caused by Space Object," United Nations Office for Outer Space Affairs, General Assembly 26th session, 1971, <https://www.unoosa.org/>.

⁷⁵ "Disintegration of COSMOS 954 Over Canadian Territory in 1978," United Nations, 2 April 1981, <https://www.unoosa.org/>.

⁷⁶ "Convention on International Liability for Damage Caused by Space Object," United Nations Office for Outer Space Affairs.

Conclusion

This study draws attention to the growing outer-space militarization and resource exploitation, showing major Indo-Pacific space powers like the United States, China, and India drive this through geopolitical threats and security dilemmas. Various sections underline the economic motivations for space competitions and militarization for resource exploitation, briefly investigating the financial incentives. Additionally, the study discusses near-earth orbit environmental aspects. Thus, the article examines how major space-power actions and interests bear responsibility for the fragile space environment and pollution. It also addresses how ambiguous space laws and less binding treaties cannot make all stakeholders behave responsibly. Moreover, the article shows how these global and regional space rivalries create complex barriers for space newcomers, sharing South Asia's experience and analyzing how small aspirants get caught between India and China.

In conclusion, the study suggests a vital need for reforms or new laws, plus data transparency, to keep the domain safe, secure, and sustainable for all. It advocates promoting astro-environmental consciousness. 🌟

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