

PAKISTAN'S APPROACH TOWARDS THE PREVENTION OF ARMS RACE OF OUTER SPACE (PAROS): GAPS IN GLOBAL SPACE GOVERNANCE

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Abstract

Outer space, long regarded as a domain for peaceful exploration, has increasingly become entangled in geopolitical competition and emerging military doctrines. The growing integration of dual-use technologies, anti-satellite (ASAT) capabilities, and space-based defense systems has undermined the civilian-military distinction, exposing critical shortcomings in the existing legal architecture, particularly the 1967 Outer Space Treaty (OST). These developments threaten strategic stability, especially in regions like South Asia, where power asymmetries and a lack of transparency exacerbate risks. This paper examines Pakistan's legal and strategic position on the weaponization of space, highlights its consistent advocacy for binding norms, equitable access, and non-militarization through multilateral forums such as the UN and the PAROS initiative. It argues that current voluntary regimes are insufficient to manage the complexity of modern space threats and calls for a revised governance framework that includes verification mechanisms, addresses legal gaps, and reflects the concerns of emerging spacefaring nations. Moreover, the study contributes to a broader understanding of how middle powers can shape inclusive, rules-based space governance in an era of intensifying competition.

Keywords: *Space Arms Control, Outer Space Treaty, Strategic Stability, Anti-Satellite Weapons, Space Governance*

Introduction

The importance of outer space has shifted in the last few decades; it has been a peaceful sphere of scientific research and satellite communications, as well as being increasingly used as a field of

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military operations, geopolitical rivalry, and strategic communication. The shift can be attributed to the launch of the Sputnik-1 in 1957, that not only marked the start of the space age but also resulted in the establishment of military space programs of the major powers and the incorporation of space technologies into the national defense policies.¹ Space-based technologies have since grown exponentially in size and complexity. Satellites and orbital systems have become deeply embedded into the military infrastructure and are being used to carry out functions that are vital to the military, such as intelligence, surveillance, and reconnaissance (ISR),² precise targeting, early warning, and secure communication. These capabilities have made outer space crucial to the command and control (C2) systems of major powers such as the United States (US), China, and Russia.³ As a result, fears regarding the weaponization of space have been compounded, especially as states seek to develop more advanced counterspace options, which heighten the dangers of conflict escalation and undermine global strategic stability.

Technological innovations, security, as well as strategic imperatives, and unresolved legal uncertainties are contributing to this transition. Space capabilities are systematically unified into integrated deterrence postures and are increasingly focused on anti-satellite (ASAT) weapons, kinetic and non-kinetic counterspace systems, space-based missile defense platforms, and dual-use satellite constellations with both commercial and military purposes.⁴ These trends have not only changed the nature of contemporary conflicts but also challenged the principles of peaceful use of outer space. Emerging and developing spacefaring countries are at a disadvantage because asymmetric progress by more powerful states limits their strategic options and endangers the viability of space as a common resource.

When international legal architecture, most notably the 1967 Outer Space Treaty (OST), was created, outer space was an unpopulated

¹ US Department of State, *Archive January 20, 2001–January 20, 2009*, <https://2001-2009.state.gov/r/pa/ho/time/lw/103729.htm>

² North Atlantic Treaty Organization. *Joint Intelligence, Surveillance and Reconnaissance*. June 19, 2025. https://www.nato.int/cps/en/natohq/topics_111830.htm

³ Tekla Gabrichidze, *The Militarization of Space: China and Russia vs. the United States* (Tbilisi: Rondeli Foundation, n.d.), <https://gfsis.org/en/the-militarization-of-space-china-and-russia-vs-the-united-states/>

⁴ Sidra Rehman, "The International Law for Outer Space Security: A Critical Overview Viewing ASATs," *IPRI Journal* 24, no. 2 (December 30, 2024): 73–94, <https://journal.ipripak.org/wp-content/uploads/>

frontier dominated by the superpowers focused on scientific exploration.⁵ Although the OST is part of space law, it mainly forbids weapons of mass destruction (WMDs) in space, and formulates general principles of peaceful use as well as non-appropriation of celestial bodies.⁶ However, it lacks control of the use of conventional weapons in space, along with the development and testing of ASAT capabilities. The Treaty also lacks a binding enforcement and verification mechanism, which significantly limits its applicability in the contemporary environment. This is further complicated by the fact that the role of the private sector is exponentially increasing, with companies like SpaceX, Blue Origin, and OneWeb launching enormous satellite constellations with dual-use capabilities.⁷ These commercial actors are more likely to operate outside the traditional arms control regimes, creating new issues of transparency, accountability, and strategic predictability.

This study critically analyzes the changing militarization of space and the governance issues it poses. It follows the path of the superpower rivalry of the Cold War period to the modern multipolar space order, which is marked by the intersection of state and non-state actors. It also notes that regional actors like India and private commercial actors are adding to a crowded and contested orbital environment hence increasing the likelihood of misperception, miscalculation, and escalation. It also assesses the major developments, such as the establishment of the US Space Force,⁸ counterspace tests by China, and deployment of electronic warfare systems and co-orbital technologies by Russia.⁹ Pakistan has always highlighted the importance of maintaining outer space devoid of conflict and weaponization. Islamabad has been in favor of the resolution on PAROS in multilateral fora such as the Conference on Disarmament

⁵ United Nations Office for Outer Space Affairs, Resolution Adopted By The General Assembly 2222 (XXI). Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>

⁶ Humanitarian Law & Policy, Space Law revisited (2/3): Are Weapons of Mass Destruction Prohibited in Space? December 21, 2016, Analysis / Law and Conflict / New Technologies / Weapons

⁷ Caleb Henry, "Space X, One Web Detail Constellation Plans to Congress," *SpaceNews*, October 26, 2017, <https://spacenews.com/spacex-oneweb-detail-constellation-plans-to-congress/>

⁸ United States Space Force, *US Space Force*, <https://www.spaceforces-space.mil/>

⁹ Tim Zadorozhnyy, "Russia Deploys Additional Electronic Warfare Systems near Estonian Border," *The Kyiv Independent*, July 24, 2025, <https://kyivindependent.com/>

(CD), the UN General Assembly (UNGA), and the Committee on the Peaceful Uses of Outer Space (COPUOS) and has supported the PPWT proposal of China and Russia.¹⁰

One of the main issues is the insufficiency of the current legal and institutional frameworks in reducing the risks associated with weaponization trends. Although efforts like the Prevention of an Arms Race in Outer Space (PAROS)¹¹ and the Treaty on Prevention of the Placement of Weapons in Outer Space (PPWT)¹² have been on the table for a long time by both China and Russia, there is still no significant progress. The unwillingness of the leading space powers, especially the US, to become parties to binding legal instruments has hindered meaningful diplomatic progress in space governance.¹³ At the same time, the differences over definitions, verification regimes, and accountability continue to exist, which further adds to the diplomatic deadlock. Despite the occasional introduction of transparency and confidence-building measures (TCBMs),¹⁴ neither of these are adequate to build a rule-based order in space.

The current development of emerging technologies, namely hypersonic glide vehicles, directed energy weapons (DEWs),¹⁵ AI-based satellite systems, and electronic warfare capabilities, has developed faster

¹⁰ Ahmad Khan, Tanzeela Khalil, and Irteza Imam, "Pakistan's Space Activities," in *Handbook of Space Security: Policies, Applications and Programs*, ed. Kai-Uwe Schrogl et al. (Cham: Springer, 2023), 1455–1473, <https://doi.org/10.1007/978-3-030-22786-9>

¹¹ United Nations General Assembly, *Prevention of an Arms Race in Outer Space*, Resolution 39/59, adopted December 13, 1984, https://www.unoosa.org/pdf/gares/ARES_39_59E.pdf

¹² Erin Pobjie and Almudena Azcárate Ortega, *Outer Space & Use of Force, Space Security Legal Primer 1* (Geneva: United Nations Institute for Disarmament Research, September 2024), <https://unidir.org/wp-content>

¹³ Erin Pobjie and Almudena Azcárate Ortega, *Outer Space & Use of Force, Space Security Legal Primer 1* (Geneva: UNIDIR, 2024), <https://unidir.org/wp-content>

¹⁴ Project Ploughshares, *Incorporating Transparency and Confidence-Building Measures (TCBMs) into Legal Approaches to the Prevention of an Arms Race in Outer Space (PAROS)*, working paper submitted to the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space, second session, Geneva, 5–16 August 2024, April 11, 2024, https://docs.library.unoda.org/Group_of_governmental

¹⁵ Itfa Khurshid, *Role of Directed Energy Weapons (DEWs) in Shaping the Future of Warfare in South Asia*, Strategic Perspectives, January 2025, <https://strategicperspectives.cissajk.org.pk/wp-content/uploads/2025/01/>

and outpaced the capacity of international governance regimes.¹⁶ The existence of such capabilities makes traditional accountability mechanisms more complicated and, at the same time, reduces the response time during a crisis situation, increasing the risk of accidental escalation. The increasing overlap of civil, military, and commercial domains further blurs the difference between peaceful space activities and possibly hostile intent. Such dynamics are especially dangerous in regions like South Asia, where historical rivalries and doctrinal ambiguity increase the possibility of conflict spillover into space.¹⁷

This paper, therefore, suggests a broader arms control agenda which would encompass revised legal instruments, technically enforceable verification regimes, and regulatory measures that would also apply to the private and commercial sectors. It highlights the need to have a hybrid model, which is the combination of binding international norms and adaptive, technology-based monitoring systems. The framework must also be structured to provide inclusive governance where there is equitable accessibility, capacity-building, and representation of emerging space actors in the decisions to determine future regulatory standards.

Strategic Evolution of Outer Space

The evolution of outer space from a field of passive scientific study and monitoring to an active military competition arena has been influenced by a combination of several technological innovations, geopolitical competition, and doctrinal development. During the first decades of the space age, outer space was largely regarded as a continuation of the Cold War rivalry between the US and the erstwhile Soviet Union.¹⁸ The successful launch of Sputnik-1 in 1957 was a significant technological achievement of the Soviet Union and also the precursor to the Soviet military space programs, which led to the creation

¹⁶ Saqiba Mengal, *Emerging Technologies and Its Impacts on Air Power*, ed. Malik Qasim Mustafa (Islamabad: Arms Control & Disarmament Centre, Institute of Strategic Studies Islamabad, September 7, 2024), https://issi.org.pk/wp-content/uploads/2024/09/IB_Saqiba_Mengal_Sept_7_2024.pdf

¹⁷ Abu Hurairah Abbasi and Saher Liaqat, *India's Evolving Space Militarization and the Security Implications for Pakistan, Strategic Perspectives*, January 2025, <https://strategicperspectives.cissajk.org.pk/wp-content/uploads/2025/01/Indias-Evolving-Space-Militarization-and-the-Security-Implications-for-Pakistan.pdf>

¹⁸ Wawrzyniec Muszyński-Sulima, "Cold War in Space: Reconnaissance Satellites and US-Soviet Security Competition," *European Journal of American Studies* 18, no. 2 (2023), published online July 3, 2023, July 10, 2023, <http://journals.openedition.org/ejas/20427>, <https://doi.org/10.4000/ejas.20427>

of satellite reconnaissance, early missile warning systems, and a space-based intelligence network.¹⁹

Space militarization gained pace in the 1980s when the US Strategic Defense Initiative (SDI) was introduced that sought to implement a multilayered missile defense system that would involve the deployment of space-based interceptors.²⁰ SDI was not created in the form that was conceived. It is now defined as a new concept of outer space as a potential warfighting domain, and has created a precedent of military space doctrines of denial and deterrence.²¹ This vision was slowly realized in the post-Cold War era as satellite technologies were placed at the center of precision strike capabilities, C2 operations, and power projection on a global scale. Space resources ceased to be an enabler of land-based warfare and became a part of the national defensive strategies of major powers.²²

These trends have gained momentum in the 21st century.²³ These ASAT systems are broadly categorized as destructive, which physically destroy the target satellite and generate debris. Whereas the non-destructive systems involve jamming, dazzling, or close-proximity maneuvers without physical destruction. The US was the first to conduct a destructive ASAT test in 1985 using an air-launched missile to destroy a satellite. The Soviet Union had tested non-destructive co-orbital ASAT systems extensively during the 1960s and 1970s. Later, China demonstrated its ASAT capability in 2007, followed by India in 2019 under Mission Shakti, where the international community expressed its concern

¹⁹ Office of the Historian, US Department of State, "The Launch of Sputnik, 1957," *Milestones in the History of U.S. Foreign Relations*, July 24, 2025, <https://history.state.gov/milestones>

²⁰ US Department of State, *Strategic Defense Initiative (SDI), 1983*, Office of the Historian, US Department of State (2001–2009 archive), <https://2001-2009.state.gov/r/pa/ho/time/rd/104253.htm>.

²¹ Natalia Shahrukh, "The Space Race Re-imagined: Outer Space Technology and Its Impact on Cross-Domain Deterrence," *Journal of Security & Strategic Analyses* 11, no. 1 (2024)

²² James Clay Moltz, *The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests*, 3rd ed. (Stanford, CA: Stanford University Press, 2019)

²³ Fernando Del Canto Viterale, "Transitioning to a New Space Age in the 21st Century: A Systemic-Level Approach," *Systems* 11, no. 5 (2023): 232, <https://doi.org/10.3390/systems11050232>

over the normalization of destructive counterspace activity.²⁴ Other P5 members have not officially tested destructive ASAT weapons to date. In the meantime, the creation of the US Space Force in 2019 institutionalized space as a separate military domain in the national defense structure.²⁵

The rationale of such developments is that space superiority is now regarded as a key to contemporary deterrence, particularly in regions characterized by strategic instability and crisis-prone relations.²⁶ Advanced powers are no longer restricting the use of space to ISR or navigation support; they are planning to deny or degrade the space capabilities of the adversary in the event of conflict. This change can be further depicted by the emergence of co-orbital systems, proximity operations, and electronic warfare devices, which provide non-kinetic methods to neutralize or interfere with space assets while leaving no physical wreckage behind, and thus attribution and response become even harder.

In parallel, the privatization of space has created new opportunities and challenges. Commercial actors like SpaceX, OneWeb, and Blue Origin have revolutionized launch access and satellite deployment through reusable rockets and low-cost mega-constellations.²⁷ However, these same systems now feature prominently in military logistics and communications. The use of Starlink in the Russia-Ukraine conflict demonstrated how commercial networks could turn into strategic assets in times of war, where it is harder to define civilian infrastructure or military targets.²⁸ The most alarming is the lack of legally binding limits

²⁴ Kelsey Davenport, "Indian ASAT Test Raises Space Risks," *Arms Control Today*, May 2019, <https://www.armscontrol.org/act/2019-05/news/indian-asat-test-raises-space-risks>.

²⁵ Taha Ali, "The US Space Force: Pioneering America's Military Dominance in the Final Frontier," *Modern Diplomacy*, July 20, 2024, <https://moderndiplomacy.eu/2024/07/20/the-u-s-space-force-pioneering-americas-military-dominance-in-the-final-frontier/>

²⁶ Sardar Jahanzaib Ghalib, *The Weaponization of Space: Global Trends, National Perspectives, and Legal Implications* (Islamabad: Arms Control & Disarmament Centre, Institute of Strategic Studies Islamabad, August 13, 2024), https://issi.org.pk/wp-content/uploads/2024/08/IB_Jahanzaib_Aug_13_2024.pdf

²⁷ G.K.S. Amruta, "The Role of Private Entities in Outer Space Activities," *International Journal for Multidisciplinary Research (IJFMR)* 7, no. 2 (March-April 2025), <https://www.ijfmr.com/papers/2025/2/41334.pdf>

²⁸ Belfer Center for Science and International Affairs, *Starlink and the Russia-Ukraine War: A Case of Commercial Technology and Public Purpose?* (Cambridge, MA: Harvard Kennedy School, 2023), <https://www.belfercenter.org/publication>

to such usage. The OST, and later international agreements, do not adequately cover such obligations of states in relation to the military use of commercial space systems.²⁹

Security Dynamics of the Outer Space

The increasingly competitive nature of the global powers is redefining the strategic environment outside of Earth. Outer space has become a sphere of vital military significance to countries such as the US, China, and Russia. Instead of considering space as a scientific or commercial domain, these states are incorporating the space domain into their defense architectures by creating specialized commands, building anti-satellite systems, and integrating space-based capabilities into their military planning.³⁰ As a result, outer space is no longer an area of scientific cooperation; it has turned into a domain of potential first-strike superiority, coercive diplomacy, and escalation processes.

The US has led this shift by embracing the concept of space dominance. The establishment of the US Space Force in 2019 was not only a bureaucratic reorganization, but it was the formal recognition of space as a warfighting domain. The American doctrine focuses on the necessity to prevent aggression and guarantee the freedom of operation in space.³¹ Space-Based Infrared System (SBIRS),³² missile warning satellites³³ and the conceptual Golden Dome shield³⁴ reflect a strategic desire to attain full-spectrum superiority. To the less technologically advanced states, this

²⁹ US Department of Defense, *Governing in a Crowded Space: The OST and Development of the Legal Regime for Space* (Washington, DC: Defense Technical Information Center, April 2018), <https://apps.dtic.mil/sti/tr/pdf/AD1095009.pdf>.

³⁰ Sher Ali Kakar, "Outer Space: A Growing Military Domain," *The Express Tribune*, February 18, 2023.

³¹ Ghazala Yasmin Jalil, *Issue Brief on "US Space Force: Is Competition in Space Inevitable?"* (Islamabad: Institute of Strategic Studies Islamabad, April 6, 2020), <https://issi.org.pk/issue-brief-on-us-space-force-is-competition-in-space-inevitable/>.

³² Center for Strategic and International Studies (CSIS), *Missile Defense Project, Space-Based Infrared System (SBIRS)*, July 26, 2021, <https://missilethreat.csis.org/defsys/sbirs/>.

³³ Lockheed Martin, *Early Missile Warning: Space Based-Infrared System (SBIRS) and Next Gen OPIR GEO*, July 24, 2025, <https://www.lockheedmartin.com/en-us/products/sbirs.html>

³⁴ Center for Arms Control and Non-Proliferation, *Golden Dome Fact Sheet*, June 2025, <https://armscontrolcenter.org/wp-content/uploads/2025/06/Golden-Dome-Fact-Sheet.pdf>.

posture is destabilizing, since it promotes competitive buildup instead of cooperative restraint.

In recent years, Chinese strategic thinking has been focusing more on the space aspect in its overall military modernization objectives, especially in what has been termed as the informationized warfare.³⁵ Advances in technology, including satellite navigation (especially with the BeiDou system), co-orbital operations, and directed energy platforms, indicate an interest in improving the resilience and performance of national space infrastructure.³⁶ Such developments seem to be directed at information superiority and protection of vital interests in possible high-technology conflicts. Although China's emerging counterspace capabilities have drawn the attention of the international community- e.g., the ASAT test in 2007- China has maintained that the development is defensive in nature and in line with the concept of strategic deterrence.³⁷ In addition, Beijing has remained committed to multilateralism in the governance of outer space, as it has jointly proposed the PPWT, demonstrating its interest in avoiding the arms race in space and facilitating peaceful exploration of the cosmos.³⁸

Faced with evolving strategic challenges and resource limitations, Russia has emphasized cost-effective and asymmetric approaches to maintain its position in the space domain. The development of capabilities such as electronic warfare systems, satellite interference tools, and proximity operations appears to be shaped by a doctrinal emphasis on strategic ambiguity and deterrence through controlled escalation. Such endeavors are an indication of a wider aim to maintain national security and strategic balance in a more contested environment.³⁹ Russia has also

³⁵ Anthony H. Cordesman and Joseph Kendall, "Chinese Space Strategy and Developments," in *Chinese Strategy and Military Modernization in 2016: A Comparative Analysis* (Washington, DC: Center for Strategic and International Studies, 2016), 427–454, <https://www.jstor.org/stable/resrep23376.15>.

³⁶ Rui Li et al., "Advances in BeiDou Navigation Satellite System (BDS) and Satellite Navigation Augmentation Technologies," *Satellite Navigation* 1, no. 12 (2020), <https://doi.org/10.1186/s43020-020-00010-2>.

³⁷ *Arms Control Today*, "Chinese Proud, Defensive About ASAT Test," March 2007, <https://www.armscontrol.org/act/2007-03/news/chinese-proud-defensive-about-asat-test>.

³⁸ United Nations General Assembly, *Further Practical Measures for the Prevention of an Arms Race in Outer Space: Report of the Secretary-General*, A/77/80 (New York: United Nations, June 24, 2022), <https://docs.un.org/en/A/77/80>.

³⁹ Nicole J. Jackson, *Outer Space in Russia's Security Strategy*, Simons Papers in Security and Development, No. 64/2018 (Vancouver: School for International

been a long-term supporter of preventing an arms race in outer space at the diplomatic level, including proposing a legally binding instrument.⁴⁰ However, some operational trends like close-proximity satellite activity and sophisticated electronic interference are commonly viewed externally as reflecting a posture that aims to exploit the ambiguities of the current legal regimes in the furtherance of national interest.

India, in its turn, is a more ambitious regional player with militarized space interests.⁴¹ The ASAT test under the Mission Shakti in 2019 marked a doctrinal change towards abandoning restraint and declaring India a space-competent military force. More importantly, the incorporation of space-based assets into the Indian defense system, such as RISAT-2B, EMISAT, Cartosat-2C, and missile-tracking systems, and the increased collaboration with the US via the Quad and Artemis Accords, amounts to a convergence of forces that threatens to tip the regional balance. Such developments present serious concerns to Pakistan.⁴² When the enhanced ISR and early warning capabilities of India are combined with its nuclear posture and ballistic missile infrastructure, they reduce the time available to make decisions and increase the risk of inadvertent escalation in time of crisis.⁴³ The reduction of decision-making increases the likelihood of misperception, pre-emptive action, and accelerated transit to the nuclear thresholds.

Structural Inequalities and Asymmetries

Structural inequalities, which are inherent in the global space governance, pose the most persistent challenge to the emerging space

Studies, Simon Fraser University, 2018), https://summit.sfu.ca/_flysystem/fedora/sfu_migrate/18164/SimonsWorkingPaper64.pdf

⁴⁰ Ministry of Foreign Affairs of the People's Republic of China, *China and Russia Jointly Submitted the Draft Treaty on PPWT to the Conference on Disarmament*, updated February 12, 2008, July 24, 2025.

⁴¹ *Indian Aerospace and Defence Bulletin*, "Harmonizing Military Space Ambitions With India's National Space Strategy: A Comprehensive Analysis," April 14, 2024.

⁴² Muhammad Zeeshan, "India's Space-Based ISR Capabilities and Regional Deterrence," *BUIITEMS Journal of Social Sciences and Humanities* 2, no. 1 (2023): 36–52, <https://bjssh.buitms.edu.pk/index.php/content/article/download/44/25/48>

⁴³ Ahmed Abbas, "Indian Ambitions for Aerospace Supremacy: Options for Pakistan," *Strategic Studies* 23, no. 1 (2003): 167–199, <http://www.jstor.org/stable/45242228>

actors more than doctrinal assertiveness. The Global South,⁴⁴ especially Pakistan, faces a significant impediment to accessing the critical strategic infrastructure, such as space situational awareness (SSA) networks, high-frequency spectrum, secure launch sites, and orbital slots. This is due to the past dominance by the early spacefaring states, the cost of developing and operating launch-vehicles, and exclusion in international forums that influence space-policy agendas have resulted in high levels of strategic dependence and socio-economic inequality among states involved in space activities. These imbalances are not merely technological: they are institutionalized in access regimes and institutions that systematically favor the interests of the established powers. They do it with exclusive rule-making opportunities, preferential financing, and export control alliances. In addition, the norm-setting activities such as the Artemis Accords,⁴⁵ Hague Code of Conduct,⁴⁶ or International Traffic in Arms Regulations (ITAR) regimes⁴⁷ exclude or marginalize the participation of new actors in such a way that they are not able to shape the establishment of the norms that regulate their own security interests in space.

The issue is also complicated by the doctrinal ambiguity of key spacefaring nations. It is not clear what will be considered as aggression in space, either cyberattacks on satellites, electromagnetic interference, or proximity operations. The absence of any declared redlines or confidence-building measures (CBMs) suggests that even routine satellite maneuvers may be mistakenly interpreted as an act of aggression, particularly in areas such as South Asia that are experiencing long-term rivalries. This ambiguity is an unnecessary strategic burden and a threat of unacceptable escalation to states like Pakistan, which have long been advocate with peaceful use of space through civil agencies like SUPARCO.⁴⁸ Therefore, the emerging strategic competition in outer space must be perceived not only through the lens of technological capability and the principles of deterrence, but also through the lens of global structural inequality. The absence of equitable access to SSA, spectrum, orbital slots, and decision-

⁴⁴ United Nations Institute for Disarmament Research (UNIDIR), *The Importance of Space Security for the Global South*, February 26, 2025, <https://unidir.org/the-importance-of-space-security-for-the-global-south/>

⁴⁵ National Aeronautics and Space Administration (NASA), *The Artemis Accords*, <https://www.nasa.gov/artemis-accords/>.

⁴⁶ Nuclear Threat Initiative (NTI), *Hague Code of Conduct Against Ballistic Missile Proliferation (HCOC)*, <https://www.nti.org/education-center/treaties-and-regimes/hague-code-conduct-against-ballistic-missile-proliferation-hcoc/>.

⁴⁷ US Department of State, *Directorate of Defense Trade Controls*, <https://www.pmddtc.state.gov/>

⁴⁸ Space & Upper Atmosphere Research Commission (SUPARCO), *Pakistan Space & Upper Atmosphere Research Commission*, <https://suparco.gov.pk/>

making forums renders the emerging spacefaring states strategically dependent and politically marginalized.⁴⁹ These distortions validate Pakistan's consistent position that outer space is to be regarded as a global common – regulated neither by control and exclusion but by fairness, inclusive, and enforceable multilateral safeguards.⁵⁰

South Asia and the Risk of Escalation in Space

Although the process of militarization of space is triggered by the interests of the major powers, its regional ramifications are especially pronounced in South Asia, which is one of the most dangerous nuclear flashpoints in the world. The integration of space-based technologies in the military doctrines of regional actors, particularly India, will lead to a destabilizing arms race that will not only destabilize regional security, but also undermine the very principle of peaceful use of outer space. Moreover, the lack of arms control mechanisms in South Asia, along with long-standing rivalries, intensifies the risks of space weaponization in an already volatile region.

The ASAT demonstration by India⁵¹ in March 2019 brought a fundamental change in the regional strategic balance. The interception and kinetic destruction of a satellite with the help of a ballistic missile was celebrated domestically as a sign of technological strength and strategic autonomy. However, it has set a dangerous precedent as this test produced a significant amount of orbital debris, which was a breach of the spirit of the OST. It also indicated that New Delhi was prepared to use military force to exercise space power.

More worryingly, Indian acquisition of dual-use capabilities, including surveillance satellites, early warning systems, and missile tracking systems, has posed a great threat to the crisis stability of the region. These assets, especially when embedded into India's nuclear

⁴⁹ Raja Qaiser Ahmed, Muhammad Shoaib, and Ramsha Ashraf, "India's Space Pursuit and the Changing Matrix of South Asian Security," *Space Policy* 65 (2023): 101564, <https://doi.org/10.1016/j.spacepol.2023.101564>.

⁵⁰ Sardar Jahanzaib Ghalib, *The Weaponization of Space: Global Trends, National Perspectives, and Legal Implications* (Islamabad: Arms Control & Disarmament Centre, ISSI, August 13, 2024), https://issi.org.pk/wp-content/uploads/2024/08/IB_Jahanzaib_Aug_13_2024.pdf.

⁵¹ European Space Policy Institute (ESPI), *India's ASAT Test Amidst Global Ambiguity*, ESPI Briefs No. 31 (Vienna: European Space Policy Institute, 2019), <https://www.espi.or.at/wp-content/uploads/espidocs/>

command and control (NC2) infrastructure,⁵² are at risk of diminishing decision-making timeframes during crises. The capability to detect, interpret, and possibly act on early satellite data brings instability to what would otherwise be well-calibrated strategic postures. These developments raise the threat of pre-emption, misperception, or unintended escalation.

In contrast, Pakistan maintains a peaceful posture in its space program. Using its civil space agency, SUPARCO, Pakistan has been working on applications that aid in national development: disaster management, agriculture, telecommunications, education, and environmental monitoring. The recent launch of earth observation satellites such as PRSS-1 and the communication satellite PAKSAT-1R, in partnership with China, is an indication of its commitment to using space in furthering socio-economic development rather than militarizing space.

Despite the growing trend of regional provocations, Pakistan has not developed or tested ASAT systems, continuing with its policy of strategic restraint and maintaining crisis stability. This asymmetry in doctrine is further aggravated by the fact that India is increasingly becoming aligned with the US and other Western powers in space-related initiatives. The establishment of frameworks like the Quad space working group and the Indian support of the Artemis Accords can be seen to be drifting towards US-led ideas of space governance, which are frequently dictated by its strategic and commercial interests instead of multilateral agreements. Pakistan is wary of such alliances, fearing that it will further entrench the military-technological advantage of India into a larger framework of preferential cooperation, further isolating other actors in the region. Pakistan has always emphasized the importance of maintaining the outer space devoid of conflict and weaponization. Islamabad has been in favor of the resolution on PAROS in multilateral fora like the Conference on Disarmament (CD), the UN General Assembly (UNGA), and the Committee on the Peaceful Uses of Outer Space (COPUOS) and has supported the PPWT proposal of China and Russia. These diplomatic efforts reflect Pakistan's conviction that a regional space arms race would erode nuclear deterrence stability and disrupt the fragile strategic balance in South Asia.⁵³

⁵² Lauren J. Borja and M.V. Ramana, "Command and Control of India's Nuclear Arsenal," *Journal for Peace and Nuclear Disarmament* 3, no. 1 (2020): 1–20, <https://doi.org/10.1080/25751654.2020.1760021>

⁵³ Ghazala Yasmin Jalil, *UNSC Resolution on Outer Space: The Challenge of Regulation* (Islamabad: Arms Control & Disarmament Centre, ISSI, June 13, 2024), https://issi.org.pk/wp-content/uploads/2024/06/IB_Ghazala_June_13_2024.pdf.

To minimize the risk of space-based conflict, Pakistan has always been supportive of international initiatives within the PAROS framework and has shown an interest in the actions that may involve regional transparency, prior notice of launches, and legally-binding codes of conduct. Pakistan has been advocating Transparency and Confidence-Building Measures (TCBMs) in outer space to enhance responsible behavior and reduce the dangers of misperception and escalation. The country has been actively participating in the discussions of the UN Group of Governmental Experts (GGEs) on the Prevention of an Arms Race in Outer Space (PAROS) and on TCBMs, supporting the ideas aimed at increasing predictability, information-sharing, and building mutual understanding among space actors. Islamabad sees TCBMs as supplementary to, not alternatives to, legal requirements; some of the measures it has endorsed in this regard include prior notice of space launching, sharing of information on national space policies, and cooperative arrangements to avert hostile applications of space technologies. The advocacy of Pakistan is a part of its larger interest in maintaining the outer space as a peaceful and equitable development sphere.⁵⁴ Such measures are not merely idealistic; they are strategic necessities. Without institutional safeguards, South Asia risks replicating its terrestrial rivalries in orbit, with consequences that could prove irreversible. Given the region's history of crisis instability, limited warning times, and doctrinal opacity, even a minor orbital incident could spiral into a broader confrontation.⁵⁵

To Pakistan, it is a matter of principle and strategic necessity to maintain outer space as a peaceful and development-oriented area. Regional asymmetry in space capabilities should not imply strategic coercion or marginalization of the peaceful spacefaring states. Islamabad has been calling on the international community to take note of the distinct dangers that space militarization presents in South Asia and to make sure that mechanisms of global governance take into account the voices, concerns, and rights of all states.

⁵⁴ Pakistan Mission to the United Nations Geneva, *Statement by Pakistan on Thematic Debate on Outer Space (Disarmament Aspects)*, Statement by Mr. Muhammad Omer, October 26, 2022, <https://pakungeneva.pk/statement-by-pakistan-on-thematic-debate-on-outer-space-disarmament-aspects/>.

⁵⁵ Irfan Mahmood Bokhari, *Statement by Pakistan at the Plenary Meeting of the Conference on Disarmament Devoted to Discussions on Prevention of an Arms Race in Outer Space (PAROS)* (Geneva: Permanent Mission of Pakistan to the United Nations, 2015), [https://docs-library.unoda.org/Conference_on_Disarmament_\(2015\)/1349%2BPakistan.pdf](https://docs-library.unoda.org/Conference_on_Disarmament_(2015)/1349%2BPakistan.pdf).

Legal Frameworks and Pakistan's Position

Outer Space Treaty

The 1967 OST is still the cornerstone of modern international space law, as it established the normative basis of peaceful exploration of space. It introduced important legal norms which include the use of outer space in the interest of all humankind (Article I), non-appropriation of celestial bodies (Article II), prohibition of weapons of mass destruction in outer space (Article IV), and the responsibility of states in governmental and non-governmental space activities (Article VI). Although it is the backbone, the OST has not been able to keep up with the fast development of strategic technologies and the changing geopolitical environment in space.⁵⁶

Pakistan considers the OST as not sufficient to cope with the emerging threats of militarization and possible weaponization of space. The treaty does not clearly prohibit the deployment of conventional weapons in orbit and does not restrict the research, testing, or deployment of ASAT systems. This legal ambiguity provides an opportunity for states to develop counterspace capabilities in the name of treaty compliance. One such case is the 2019 ASAT test conducted by India, which did not technically break the OST, but did evidently contradict its spirit of peaceful utilization of space.

The second major weakness of the OST is the absence of verification and enforcement measures. Contrary to nuclear arms treaties like the Non-Proliferation Treaty (NPT) or the Comprehensive Test Ban Treaty (CTBT), which are supported by inspection systems and international monitoring, the OST is only based on voluntary compliance. This strategy is inadequate in the current congested and competitive space environment. Another problem is the increasing role of the participation of private companies, and particularly those running large satellite constellations with dual-use capabilities. The treaty does not provide any effective enforcement or liability tools, although it places responsibility on states regarding the conduct of their commercial actors. Islamabad has supported and co-sponsored initiatives under the PAROS agenda at the United Nations General Assembly (UNGA), the Conference on Disarmament (CD), and the Committee on the Peaceful Uses of Outer Space (COPUOS). It has also endorsed the Treaty on the Prevention of the Placement of Weapons in Outer Space (PPWT), jointly proposed by China

⁵⁶ United Nations General Assembly, *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, Resolution 2222 (XXI), adopted December 19, 1966, <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>.

and Russia. While acknowledging the limitations of the PPWT, such as the absence of a verification mechanism, Pakistan views it as a constructive foundation for further negotiation.⁵⁷

Moreover, the legal ambiguity surrounding the term “peaceful purposes” remains a persistent problem. While some countries interpret it to mean non-military, others argue it allows military use if it is non-aggressive. This ambiguity has allowed dominant spacefaring states to develop military capabilities while remaining nominally compliant. Islamabad has continuously demanded that such terminologies be clarified to avoid exploitative interpretations that can erode collective security.⁵⁸

Another important aspect that needs to be reformed is the legal approach to the extraction of space resources. On the one hand, the OST does not allow national appropriation of celestial bodies; on the other hand, it does not indicate whether or not private actors can extract and own resources on the Moon or asteroids. The US Commercial Space Launch Competitiveness Act (2015)⁵⁹ and other national regulations in the UAE, Luxembourg, and Japan have unilaterally legalized space mining. Pakistan views such activities as being incompatible with the concept of the global commons and has called upon the creation of a multilateral system of equitable sharing of benefits and environmental management of extraterrestrial resources.

In addition, Article XVI of the OST permits any party to leave the treaty with just one year of notice, without justification or consultation. Such permissiveness is dangerous in the existing strategic environment. A major power could leave the OST and go ahead to militarize space with minimal international redress. Pakistan has favored the strengthening of withdrawal measures, including the introduction of obligatory review mechanisms and formal diplomatic consultations to prevent weakening of the treaty. In light of such deficiencies, Pakistan proposes that the international community conduct a Space Law Review Conference, which will proceed to develop an additional protocol to the OST.⁶⁰ This protocol should not only close the existing legal gaps but also reflect the realities of

⁵⁷ *Pakistan Today*, “Pakistan Pushes for Preventing Weaponization of Outer-Space to Avert Threats to Peace,” May 7, 2024.

⁵⁸ Betty Wehtje, “Increased Militarisation of Space – A New Realm of Security,” *Beyond the Horizon*, June 6, 2023, <https://behorizon.org/increased-militarisation-of-space-a-new-realm-of-security/>

⁵⁹ Space Foundation Editorial Team, *US Space Law*, Space Foundation, https://www.spacefoundation.org/space_brief/us-space-law/.

⁶⁰ Ghazala Yasmin Jalil, *Pakistan's Space Policy: Tapping into the Space Potential* (Islamabad: Arms Control & Disarmament Centre, ISSI, December 29, 2023), https://issi.org.pk/wp-content/uploads/2023/12/IB_Ghazala_Dec_29_2023.pdf

the new technologies and interests of the players involved. This type of framework must not be on a voluntary basis but on binding commitments so that space can remain a domain of cooperation and not conflict.

Prevention of an Arms Race in Outer Space (PAROS)

PAROS has been a center of multilateral disarmament diplomacy, especially for states such as Pakistan that want to maintain outer space as a realm of peaceful collaboration and fair development.⁶¹ Initially proposed in the early 1980s, the PAROS initiative reflects the awareness of the international community that current legal regimes, primarily the OST, are inadequate to forestall the increasing militarization of space. Although there is near-universal rhetorical support, there has been little practical progress on PAROS because of deep-seated strategic interests, particularly those of the powerful spacefaring nations.

PAROS is not only a political desire, but a legal and strategic necessity. The lack of binding multilateral commitments regarding the deployment of conventional weapons in space, testing of ASAT systems, or control of non-kinetic counterspace capabilities has led to unregulated space that is prone to coercion, miscalculation, and technological imbalance. To new spacefaring countries, this vacuum increases structural asymmetries and poses a long-term risk to secure orbital resources.

One of the most important barriers to PAROS has been the refusal of the US and its allies to accept the proposed PPWT. Although the PPWT has been denounced as having weak verification procedures and not covering ground-based ASAT systems, it still provides a starting point of discussion. Pakistan has supported the PPWT and has urged its revision and extension, suggesting that future versions should include enforceable verification mechanisms, monitoring of dual-use systems, and incorporation of the private commercial sector into its scope.

Additionally, Islamabad has stressed that any future space arms control regime should be legally binding, inclusive, and sensitive to changing technological realities. Pakistan has urged the thorough ban of all weapons in outer space (not just WMDs) at multilateral forums and raised an alarm on the destabilizing effects of ASAT tests and counterspace capabilities. It promotes the creation of verification mechanisms and transparency measures, and it urges fair access to space technologies and orbits by the developing world. For Pakistan, PAROS is not simply about preventing a future arms race; it is about preventing the normalization of existing military behavior in space. The 2019 ASAT test by India, the weaponization of satellite constellations of commercial satellites, and the

⁶¹ Shamil Abdullah, "Outer Space Weaponization and Potential Gaps within PAROS," *Strategic Vision Institute (SVI)*, December 19, 2024, <https://thesvi.org/outer-space-weaponization-and-potential-gaps-within-paros/>.

emergence of proximity operations are early warning signs of such systemic drifts to hostility. Unless there is a strong diplomatic effort, such tendencies can become the new status quo.⁶²

Pakistan has been a firm supporter of the PAROS and has continued to advocate the application of legally binding instruments through multilateral forums, particularly the CD and the UNGA, to ensure that the peaceful use of outer space is guaranteed. Islamabad has voiced concern on several occasions about the destabilizing effects of ASAT weapons, on the inadequacy of voluntary or non-binding space governance regimes, and on the necessity of space security arrangements that are inclusive and based on consensus. Although Pakistan has never presented official suggestions on CBMs, it has been a strong advocate of the idea to increase transparency, accountability, and verification, especially in the face of the proliferation of dual-use technologies, the danger of unregulated proximity operations, and the growing involvement of commercial activities in strategic space.⁶³ Its stance is part of a wider demand to have fair access to space governance and an enforceable international norm to avert weaponization and ensure long-term sustainability. These measures are particularly vital for regions like South Asia, where high-alert postures and compressed decision-making timelines elevate the risk of conflict escalation. The replication of terrestrial rivalries in space would severely undermine nuclear deterrence stability and compound existing security dilemmas by reducing the effectiveness of early warning and communications systems and increasing the risks of miscalculation and unintentional escalation.⁶⁴

For Pakistan, the success of PAROS depends on two simultaneous tracks: (1) norm development through voluntary and politically binding confidence-building efforts, and (2) legal codification through a revised and enforceable treaty framework. These tracks should be followed in an

⁶² Permanent Mission of Pakistan to the United Nations, *Statement by the Delegation of Pakistan on Agenda Item 51: International Cooperation in the Peaceful Uses of Outer Space (Fourth Committee)*, United Nations General Assembly, 2022, https://www.un.org/en/ga/fourth/pdf/PakistanEN_item_51.pdf.

⁶³ Permanent Mission of Pakistan to the United Nations, *Statement of the Pakistan Delegation at the 67th Session of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)* (Vienna: United Nations, June 19–28, 2024), https://www.unoosa.org/documents/pdf/copuos/2024/statements/5_Pakistan.pdf.

⁶⁴ *Statement by the Delegation of Pakistan on Agenda Item 51: International Cooperation in the Peaceful Uses of Outer Space (Fourth Committee)*

inclusive manner where emerging space actors, who are usually left out in high-level negotiations, have meaningful inputs.

Pakistan points out that outer space is a global commons and cannot be governed by only the powerful states. A rules-based order in space that protects peaceful use, discourages weaponization, and promotes fair and equitable access is not only in the national interest of Pakistan, but in keeping outer space an arena of mutual progress and collective security.

Challenges in Space Arms Control

The development of an effective arms control regime in outer space is faced with technological, legal, political, and institutional barriers. These issues are not hypothetical, and they have severe consequences for states such as Pakistan that subscribe to the peaceful uses of space but are progressively facing asymmetries as the powerful states are militarizing space. The obstacles to effective arms control are more multifaceted because space is institutionalized in the military doctrines and the commercial sphere.⁶⁵

Among the most urgent concerns is the dual-use character of space technologies. Numerous systems, including remote sensing satellites, proximity operation vehicles, or satellite servicing platforms, have legitimate civilian or commercial purposes and can also be used militarily. This overlap makes it difficult to define space weapons in international law. To emerging space actors such as Pakistan, the proliferation of ambiguous, multi-purpose systems by the major powers establishes a norm of strategic opacity, undermining trust and raising the likelihood of misperception or miscalculation in a crisis.⁶⁶

The second issue is that there are no universally agreed definitions of hostile behavior in space. No legal agreement exists on what an act of aggression is: is it the intentional jamming of a satellite? The obscuring of sensors? Satellite ground stations cyber attacks? Or the launching of a co-orbital satellite which casts a shadow over an asset of another state? Such a gap in definition gives spacefaring powers the opportunity to engage in provocative behavior without facing responsibility. This legal ambiguity promotes a culture of impunity, particularly in areas where deterrence relationships are weak.

⁶⁵ *Second to None*, "National Space Legislation: A Necessity for Pakistan," July 23, 2023, <https://secondtonone.com.pk/2023/07/23/national-space-legislation-a-necessity-for-pakistan/>

⁶⁶ Space Generation Advisory Council, *The Challenges of Dual-Use Space Technologies: The Non-Peaceful Use of Satellites*, <https://spacegeneration.org/the-challenges-of-dual-use-space-technologies-the-non-peaceful-use-of-satellites>

Another dilemma is verification. Conventional arms control treaties are based on physical inspection, exchange of telemetry, or treaty-monitoring agencies. These mechanisms are hard to apply in space because of the problem of attribution, orbital dynamics, and jurisdiction. Despite the promising verification tools provided by the development of SSA through the application of AI, commercial tracking data, and ground-based radars, their application is disjointed and restricted to those countries with strong space surveillance capabilities. Pakistan has advocated for multilateral inclusion of SSA capabilities, such as equal access to tracking information and joint verification procedures.

The growing role of commercial and private actors poses a special regulatory problem. Companies such as SpaceX, Amazon Kuiper, and India IN-SPACe are launching huge constellations with both civilian and strategic purposes. The involvement of Starlink satellite networks in military communication during the Russia-Ukraine conflict showed the direct participation of commercial systems in active warfare.⁶⁷ However, there is no apparent enforcement mechanism in international law instruments such as the OST to govern or penalize such use. This unregulated privatization of strategic capabilities erodes not only the sovereignty of states but also establishes an unequal playing field in access, influence and security.

Technological disparity is another problem associated with it. Spacefaring powers have first-mover advantages in orbital positioning, spectrum allocation, and launch infrastructure. This privileged position enables them to shape the meaning of responsible behavior in space in their own way, at the expense of or without regard to the developmental interests of less-capable states. Unless negotiations are inclusive, the future arms control norms are likely to be biased in favor of a small number of powerful players. Consequently, this paper recommends that arms control in space should have provisions of technology sharing, access to orbital slots, and financial and institutional assistance to emerging space programs.

In addition, space cybersecurity risks are not well understood and addressed. Satellite systems are very susceptible to cyber intrusions, spoofing, and data corruption but there are no legally binding agreements on cyber behavior in outer space. Such vulnerabilities pose operational and sovereignty risks to countries such as Pakistan that depend on foreign collaborations in the development of satellites and telemetry. The

⁶⁷ Akash Shah, "Commercial Space Assets in Modern Warfare: Lessons from Russia-Ukraine Conflict," *Strategic Vision Institute (SVI)*, October 23, 2023, <https://thesvi.org/commercial-space-assets-in-modern-warfare-lessons-from-russia-ukraine-conflict/>

integration of cyber arms control into broader space governance is therefore essential to any credible regime.

Lastly, the absence of a dedicated institutional architecture for space arms control like the IAEA for nuclear verification or the OPCW for chemical weapons, has left regulatory responsibilities fragmented. While COPUOS, the CD, and the UN First Committee all engage with space issues, none possess enforcement authority. A UN-led body with the mandate to monitor military space activity should be established to facilitate CBMs and enforce compliance with future legal frameworks.

To address these challenges, this study proposes a hybrid arms control model that combines:

- Legally binding agreements prohibiting specific classes of weapons and behaviors;
- Technically enforceable verification regimes, including AI-supported SSA and third-party tracking data;
- Regulation of commercial actors through international registration, licensing, and end-use restrictions;
- Transparency frameworks, including launch notifications and orbital proximity declarations;
- Multistakeholder governance structures that include emerging spacefaring nations, private industry, and civil society.

In the absence of such reforms, outer space risks becoming an unregulated battlespace where first-mover advantage, not legal obligation, dictates behavior. For states like Pakistan, this would mean increased vulnerability, diminished strategic autonomy, and reduced opportunities for peaceful development through space technology. A just and effective space arms control regime must therefore confront these challenges through legal innovation, political will, and global cooperation.

Conclusion

Weaponization of outer space can no longer be considered a hypothetical issue; it is a rapidly developing fact, with severe consequences to global security, strategic stability, and fair development of emerging spacefaring nations. The once scientific field of collaboration and exploration has quickly turned into a field of contention where military superiority, technological dominance, and strategic denial inform policy decisions. To the developing space actors, including Pakistan, this change is not only a challenge to national sovereignty but also a threat to the principle of space as a global common. Early agreements like the 1967 OST were important at the time, but not adequate in covering the issues of space security in the contemporary world. Their non-action on conventional weapons, dual-use technologies, and privatization of the military sector has left legal loopholes that are being systematically used by the powerful space nations. The failure to implement transparency,

verifications, or accountability in this regard has created a situation where activities like ASAT testing, proximity operations, and cyber interference activities have become normalized, which is a threat to regional and global stability. These developments are especially destabilizing in South Asia. The ASAT test conducted by India, its incorporation of space capabilities into the strategic command and control, and its increasing technological connections to world powers run the risk of initiating a space arms race in the region. Pakistan, although it has credible strategic deterrence, has chosen to avoid counter-escalation in space. Rather, it has taken the path of principled diplomacy, supporting international norms such as PAROS and the PPWT, endorsing transparency and confidence-building activities, and developing the peaceful use of space technology through the development-oriented mandate of SUPARCO.

These risks are further aggravated by a lack of inclusive governance mechanisms. Technologically advanced states and commercial giants continue to dominate the current discourse on space policy by silencing the voices of the emerging space actors. This exclusion does not only increase structural inequalities in access to space but also compromises the legitimacy and sustainability of any possible future space governance regime. As Pakistan has always maintained, the realm of outer space should be democratized to accommodate the interests, rights, and responsibilities of all spacefaring nations, irrespective of their capability. It is time to act now, before the last frontier is turned irreversibly into the next battlefield. A shared interest in peace, equity, and responsibility in space governance is not only desirable, but it is necessary to ensure that outer space continues to be a frontier of opportunity to all and not an instrument of the few.

