Journal of Aerospace & Security Studies
2025 | Volume IV

Astropolitical Alliances: Competition and Cooperation in Space

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Abstract

The Artemis Accords and the International Lunar Research Station (ILRS) herald the emergence of astropolitical alliances spearheaded by the United States (US) and China. This working paper explores the formation of these alliances and their astropolitical implications. A thematic analysis of Western and Chinese sources examines the narratives surrounding both alliances, as well as the commercial interests, security imperatives, and geopolitical factors that influence states' decision-making to join either alliance. The paper views these alliances through the theoretical lenses of liberalism, realism, and constructivism, providing a holistic reflection on how cooperative aspirations, competitive tensions, and normative considerations have shaped alliance formation. Drawing on a comparative analysis, the study posits that while intra-alliance relations are based on cooperation, geopolitical competition arising from Sino-US tensions impedes inter-alliance collaboration. Consequently, these alliances are evolving into competing frameworks that seek to dictate norms of space governance. Notably, the paper explores how these alliances navigate legal ambiguities and challenge the egalitarian ethos of the foundational space treaties. The paper discusses whether member states can prevent the escalation of tensions between these alliances and establish cooperative linkages. The findings suggest that the current trajectory of these alliances signals a bifurcated global space order. The conclusion proposes pragmatic multilateral space governance recommendations to ensure collaborative, sustainable, and peaceful utilisation of space.

Keywords: Astropolitical Alliances, US, China, Competition, Cooperation, Outer Space Treaty

Introduction

Inter-state competition and cooperation in space have been in constant tension since the advent of the global space age. Space became a political domain during the Cold War, from 1957 to 1991, when states continued their space partnerships with competing ideological systems across the Iron Curtain. The Cold War era saw limited space cooperation (e.g., the Apollo–Soyuz mission in 1975), but intense rivalry often underpinned nationalistic space endeavours. Since the end of the Cold War, scholars have noted an increase in examples of international space collaboration. The International Space Station (ISS), which involves the National Aeronautics and Space Administration (NASA), Roscosmos, European Space Agency (ESA), and others, is frequently cited as a model of post–Cold War space partnerships.

However, the cooperative equilibrium post-ISS fractured with the 2015 US Commercial Space Launch Competitiveness Act, which legitimised private celestial resource extraction. This unilateral move by the US destabilised multilateral governance by directly contradicting the principles of the Outer Space Treaty (OST) which viewed space as the 'province of all mankind.'[1] The 1979 Moon Agreement had similarly attempted to institutionalise equitable resource sharing but garnered minimal adherence. This is because the OST and the Moon Agreement were underpinned by an idealistic vision of space exploration, which was fundamentally at odds with the rapid rise in private space actors with competing commercial interests.[2] States and corporations are now vying for lunar resources (e.g., helium-3, water ice) and strategic positioning at the resource-rich Lunar South Pole.[3]

From the first human spaceflight in 1961, space has thus transformed into a domain where economic opportunities, technological innovations, and military dominance converge.[4] The politics of space, or astropolitics, is therefore broadly understood as the study of the influence of terrestrial politics on states' economic,

1 United Nations Office for Outer Space Affairs, "RESOLUTION ADOPTED BY THE GENERAL ASSEMBLY," December 19, 1966, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html.

2 Madi Gates, "Houston, We Have a Problem: International Law's Inability to Regulate Space Exploration", NYU JILP (blog), January 2, 2025, https://nyujilp.org/houston-we-have-a-problem-international-laws-inability-to-regulate-space-exploration/.

3 Almudena Azcárate Ortega, "Artemis Accords: A Step Toward International Cooperation or Further Competition?" *Lawfare*, December 15, 2020, https://www.lawfaremedia.org/article/artemis-accords-step-toward-international-cooperation-or-further-competition.

4 Santiago Rementeria, "Power Dynamics in the Age of Space Commercialisation," *Space Policy* 60 (2022) https://doi.org/10.1016/j.spacepol.2021.101472.

technological, and military activities in space.[5] Since the end of the Cold War, the international space club, which was once quite exclusive, has now significantly expanded to nearly 80 national space agencies globally.[6] Dozens of states play an active role in space politics and are now joining astropolitical alliances that seek to advance shared norms and goals in space exploration.[7] US leads the Artemis Accords, whereas China spearheads the International Lunar Research Station (ILRS) along with Russia as a supporting partner.[8] The global framework of space governance has remained essentially unchanged for over 50 years. However, it is now being challenged by these alliances which have started forming only in the past 5 years.

Against this backdrop, the Artemis Accords and ILRS have crystallised as competing astropolitical alliances driven by three intertwined forces: geopolitical rivalry (e.g., the Wolf Amendment barring U.S.-China cooperation), economic imperatives (trillion-dollar lunar mining prospects), and normative contestation (reinterpreting OST provisions to suit alliance objectives). Artemis Accord promotes the commercialisation of space through entities like SpaceX, while ILRS champions state-led development under China's vision of a 'shared destiny' in space. This bifurcation risks fragmenting space governance into exclusionary spheres of influence. The OST's foundational vision would also be undermined as the US heads back to the Moon with its Artemis allies.[9] Similarly, China plans to establish a long-term lunar presence along with its ILRS partners. Consequently, this paper addresses five critical questions: how have these alliances emerged as competing blocs; the factors driving state alignment; the interplay of competition and cooperation within and between alliances; their implications for global space governance; and whether member states can avert a bifurcated space order.

These five questions confine the scope of the paper to exploring various themes related to astropolitics and international space cooperation. Notably, it does not engage with the technological, technical, logistical and ethical implications of

5 Seyedmohammad Seyedi Asl, "ASTROPOLITICS AND USA-CHINA'S NEW GEOPOLITICAL RIVALRY AREA", *AUSTRAL: Brazilian Journal of Strategy & International Relations* 13, no. 26 (2024):52-71, https://doi.org/10.22456/2238-6912.140840.

6 Asl, "ASTROPOLITICS AND USA-CHINA'S NEW GEOPOLITICAL RIVALRY AREA," 56.

7 Francisco Del Canto Viterale, "Global Power Dynamics in the Contemporary Space System," *Systems* 13, no. 4 (2025) https://doi.org/10.3390/systems13040276.

8 Francisco Del Canto Viterale, "Global Governance of the Space System: A Multilevel Governance Analysis," *Systems* 12, no. 9 (2024) https://doi.org/10.3390/systems12090318.

9 Mariel Borowitz, Althea Noonan, and Reem El Ghazal, "U.S. Strategic Interest in the Moon: An Assessment of Economic, National Security, and Geopolitical Drivers," *Space Policy* 69 (2024) https://doi.org/10.1016/j.spacepol.2023.101548.

establishing lunar bases and resource extraction, which are beyond the scope of discussion. The findings suggest that these alliances risk replicating terrestrial competition over critical mineral resources. Nonetheless, they will significantly influence the next era of space exploration, where the promise of progress will intersect with the peril of terrestrial conflicts being projected into the cosmos. The rationales influencing the membership of states in either alliance highlight how astropolitics has been shaped by cooperative noble ideals and competing national interests since the start of the global space age.

Theoretical Framework

The formation of astropolitical alliances has sparked several theoretical debates within the field of international relations (IR) scholarship. However, any specific theory will have limited explanatory power to examine all aspects relevant to this paper. This limitation stems from the interplay between competition, cooperation, and normative reconstruction in space governance which exceeds the scope of any single theoretical paradigm. Hence, the analysis of alliance formation and evolution necessitates a multidimensional theoretical approach. By integrating neorealist, neoliberal institutionalist, and constructivist perspectives, this analysis reveals how material power dynamics, institutional frameworks, and discursive legitimisation position the Artemis Accords and ILRS as competing frameworks.

At its core, the paper applies Neorealism, which offers the most appropriate theoretical lens to view the formation of astropolitical alliances.[10] This is evident in how structural compulsions stemming from Sino-US tensions contribute to enduring competition in an anarchic international system.[11] Thus, from a realist perspective, the Accords and ILRS are tools for power projection in the cosmos. Fundamentally, realist scholars would frame the formation of these alliances as a zero-sum game where controlling critical lunar resources and territories is a strategic imperative for both the US and China. In this context, the Artemis Accord's exclusion of China, as stipulated in the Wolf Amendment, can be theoretically interpreted as a containment strategy aimed at ensuring US hegemony on the Moon and beyond.[12] It is also aligned with the narratives of US

10 Fikri Haikal Akbar, Abubakar Eby Hara, and Honest Dody Molasy, “Competition Among Spacefaring States in the Exploration of 'Terra Nulius' in Outer Space: A Neorealist Approach,” *Astropolitics* 21, no. 2–3 (2023): 206–13, https://doi.org/10.1080/14777622.2023.2280019.

11 Asma Rashid and Nigham Fatima, “The Great Game of Space: Space Political Adventurism and Battle for Superpower Status Beyond the Horizons”, *NUST Journal of International Peace & Stability* 7, no. 2 (2024): 15–29, https://doi.org/10.37540/njips.v7i2.171.

12 Paul J. Bolt, “American Sanctions on China's Space Program: Effective Economic Statecraft?” *Space and Defense* 15, no. 1 (2024): 18-34, https://doi.org/10.32873/uno.dc.sd.15.01.1037.

officials, who claim that China has 'ambitions to occupy resource-rich areas on the Moon.'[13] Similarly, realists would view the ILRS as a counterbalancing alliance aimed at preventing US lunar hegemony. The resulting Sino-US lunar competition mirrors realist Cold War-era astropolitics.

However, while realist theory explains how states bandwagon with the US or China to secure their national interests, realism alone cannot explain why certain states pursue dual membership or why institutionalised cooperation persists within alliances despite astropolitical tensions. This is where neoliberal institutionalism provides critical insight: both alliances establish rule-based frameworks that reduce transaction costs and enable collective gains through standardised operations. Liberal theories would also focus on the potential of space diplomacy through cooperative astropolitical frameworks.[14] For instance, as stated in the introduction, the collaborative success of the ISS over the past two decades underscores how institutionalised cooperation between great powers (the US and Russia) can persist despite contentious terrestrial geopolitics.[15] In this context, the liberal institutionalist view would be that these alliances could collectively resolve disputes regarding space governance. Although, going by the neoliberal argument, while the Artemis Accords support intra-alliance inclusion and collaboration, the coalition remains fundamentally exclusionary from an inter-alliance perspective (it excludes China and its allies).

A Constructivist perspective departs from strictly realist or liberal analyses of competition and cooperation to study how alliances are formed through speech and discourse. It highlights how these alliances establish new norms in space governance by reinforcing competing narratives that validate their leadership claims.[16] Thus, constructivism offers nuanced insights into how the two alliances justify their respective space governance systems through discourse. The Artemis Accords, for example, are deemed essential for a 'rules-based' astropolitical order

13 Bryan Bender, "'We Better Watch out': NASA Boss Sounds Alarm on Chinese Moon Ambitions," *POLITICO*, January 1, 2023, https://www.politico.com/news/2023/01/01/we-better-watch-out-nasa-boss-sounds-alarm-on-chinese-moon-ambitions-00075803.

14 Mai'a K. Davis Cross and Saadia M. Pekkanen, "Introduction. Space Diplomacy: The Final Frontier of Theory and Practice", *The Hague Journal of Diplomacy* 18, no. 2-3 (2023): 193-217, https://doi.org/10.1163/1871191x-bja10152.

15 Seanna Pieper-Jordan, "The International Space Station: Peaceful Common Ground for Adversaries," (presentation, UM Graduate Student Research Conference, University of Montana, MT, February 24, 2023) https://scholarworks.umt.edu/gsrc/2023/326/8/.

16 Scott Pace, "U.S. Space Policy and Theories of International Relations: The Case for Analytical Eclecticism", *Space Policy* 65 (2023) https://doi.org/10.1016/j.spacepol.2022.101538.

by the US State Department.[17] Promoting this rules-based order narrative reinforces informal binaries with China, whose vision for a 'shared destiny for humanity' also challenges Western dominance in space.[18] This theoretical integration underscores how material interests, institutional designs, and ideational contestation continuously interact, reinforcing fragmentation while creating openings for cooperation in space. It thus captures the intricate reality of 21st-century astropolitics, a field where power and principles converge to reshape humanity's exploration of the cosmos.

Methodology

A qualitative methodology was adopted, considering it is well-suited to explore the interplay between competition and cooperation in space by leveraging its strength in examining nuanced astropolitical dynamics. The paper employed a comparative case study approach. It facilitated the analysis of the formation of both alliances as well as their implications for the framework of global space governance. The comparative approach also enabled the identification of converging and diverging aspects, such as competition over lunar resources and contrasting interpretations of compliance with the OST. Data was gathered from secondary sources comprising treaty texts, policy documents, books, research articles, online publications, and reputable media outlets. Key themes about astropolitical alliances, soft power projection, global space governance, competition and cooperation in space were extracted from the study using a thematic analysis. To mitigate bias, media narratives were balanced across Western and Chinese sources by presenting both perspectives.

Data was drawn from five categories of secondary sources:

- Primary Documents: Treaty texts (OST, Artemis Accords, ILRS Charter) and policy statements from NASA and China National Space Administration (CNSA).
- Scholarly Publications: Peer-reviewed articles with 'astropolitics,' 'space governance,' or 'lunar exploration' keywords (2020–2025).
- Institutional Reports: Publications from United Nations Office for Outer Space Affairs (UNOOSA), Secure World Foundation, and space agencies.

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17 Zhanna L. Malekos Smith, "Empowering the Artemis Accords Coalition for Peace and Stability," Carnegie Council for Ethics in International Affairs, March 6, 2024, https://www.carnegiecouncil.org/media/article/empowering-artemis-accords-coalition-peace-stability.

18 Xiaodan Wu, "The International Lunar Research Station: China's New Era of Space Cooperation and Its New Role in the Space Legal Order," Space Policy 65 (2023) https://doi.org/10.1016/j.spacepol.2022.101537.

- Media Analysis: Coverage from reputable space-focused outlets in the West (e.g., SpaceNews, Space.com) and in China (e.g., Global Times, APSCO bulletins) that report on alliance developments.

Literature Review

Astropolitics is dominated by great-power dynamics, according to recent research. For example, Morin and Tepper's structural-power analysis reveals that the US, through its extensive commercial space industry and international partnerships, has successfully globalised its preferred norms.[19] In contrast, China's capabilities have not yet translated into equivalent normative influence in space governance. Such findings underscore that power asymmetries and strategic competition increasingly shape astropolitics. For instance, Johnson-Freese and Weeden apply Elinor Ostrom's common-pool-resource principles to space, noting that near-Earth orbit is an increasingly 'crowded, congested and contested environment' at risk of conflict.[20] Overall, literature views space as a global commons that remains subject to geopolitics, being both a domain for competition and cooperation.

However, some gaps remain. Notably, scholarship mainly considers cooperation as diffusion (through treaties, agencies, and bilateral projects) rather than explicitly examining alliances or coalitions. The concept of 'astropolitical alliances' remains under-theorised, partly because it is a relatively recent phenomenon as noted earlier. Thus, there is a lack of systematic analyses of how formalised space coalitions (like Artemis or ILRS) alter state incentives, strategic alignments, and the evolution of space law. This research paper aims to fill these gaps. By exploring how these coalitions affect cooperation (by offering cooperative missions) as well as competition (by establishing blocs and normative divergence), it places 'astropolitical alliances' at the intersection of the three major IR theories i.e. neorealism, realism, and constructivism. This offers a novel integrated theoretical framework to the discussion of space governance and astropolitics.

Contemporary Astropolitical Alliances

The Artemis Accords and the International Lunar Research Station (ILRS) initiative can be seen as nascent 'alliances' in space: agreements that commit signatory states to common exploration programs and principles. For example, the Artemis Accords articulate principles (e.g. peaceful purposes, transparency, resource sharing) intended for all participants but exclude China and Russia. In contrast,

19 Jean-Frédéric Morin and Eytan Tepper, "The Empire Strikes Back: Comparing US and China's Structural Power in Outer Space," Global Studies Quarterly 3, no. 4 (2023) https://doi.org/10.1093/isagsq/ksad067.

20 Joan Johnson- Freese and Brian Weeden, "Application of Ostrom's Principles for Sustainable Governance of Common-Pool Resources to Near-Earth Orbit", Global Policy 3, no. 1 (2012): 72-82, https://doi.org/10.1111/j.1758-5899.2011.00109.x.

China presents the ILRS as an 'open facility on the lunar surface,' emphasising 'sufficient discussion, joint construction and international sharing' of lunar infrastructure. Chinese discourse frames the ILRS as an 'international cooperation platform' that seems explicitly more inclusive compared to the Artemis Accords.

Official statements (translated by Chinese media) emphasise that 'outer space is not an arena of competition among countries, but an important sphere for cooperation and win-win'. China's foreign ministry spokesperson has also underscored that the peaceful exploration of space 'is a common cause of all mankind' and that China is 'committed to peaceful use of outer space' through broad partnerships.[21] This cooperative framing echoes President Xi Jinping's stated vision that 'global governance of outer space shall be guided by the philosophy of a community with a shared future.' In other words, official Chinese discourse portrays the ILRS as an inclusive, multilateral vision i.e., the 'shared future' paradigm for humanity's future in space.

There is also a sharp divergence between the two alliances regarding space infrastructure development. The Artemis Accords champion a commercial model grounded in neoliberalism, which prioritises commercial participation. This is evident by the critical role that SpaceX Starship is set to play in lunar landings and the subsequent construction of the planned lunar installations.[22] While this would be a massive boost for the space economy, it would establish a monopoly in space exploration for firms like SpaceX. Conversely, the ILRS could prioritise state-driven efforts, directing space infrastructure development that is likely aligned with the centralised government systems in both China and Russia.

Artemis Accords

The US initiated the Artemis Accords in October 2020 based on the Artemis Programme, which envisions human settlement on the Moon.[23] According to NASA administrator, Jim Bridenstine, Artemis is planned to be the most diverse and broadest international human spaceflight programme. The Artemis Accords will be crucial for establishing an astropolitical alliance that drives the Artemis programme

21 Ministry of Foreign Affairs of the People's Republic of China, "Foreign Ministry Spokesperson Lin Jian's Regular Press Conference on October 28, 2024," Updated October 28, 2024, https://www.mfa.gov.cn/eng/xw/fyrbt/202410/t20241028_11517200.html

22 Lee Mohon,"NASA, SpaceX Illustrate Key Moments of Artemis Lunar Lander Mission," NASA, November 20, 2024, https://www.nasa.gov/directorates/esdmd/artemis-campaign-development-division/human-landing-system-program/nasa-spacex-illustrate-key-moments-of-artemis-lunar-lander-mission/.

23 "Artemis Accords," NASA, accessed April 20, 2025, https://www.nasa.gov/artemis-accords/.

forward.[24] They propose a shared roadmap and non-binding framework for space exploration by formulating standard guidelines and best practices for activities carried out in orbit, on the lunar surface and subsurface, on Mars, comets, and asteroids. Fundamentally, the Artemis Accords are grounded in 10 key cooperative principles: Peaceful Purposes; Transparency; Interoperability; Emergency Assistance; Registration of Space Objects; Release of Scientific Data; Protecting Heritage; Space Resources; Deconfliction of Activities; and Orbital Debris and Spacecraft Disposal. As of November 2025, there are 60 signatories.[25]

International Lunar Research Station (ILRS)

A year after the Artemis Accords were announced, the International Lunar Research Station (ILRS) was jointly initiated by China's National Space Administration (CNSA) and Russia's state space corporation, Roscosmos.[26] As the name implies, the ILRS is planned to be a research outpost on the Moon manned by humans, similar to the scientific research facilities in Antarctica. The basic facility of the ILRS will be built on the Lunar South Pole and is expected to be operational by 2035, with an expanded version by 2040.[27] The ILRS has outlined eight key cooperative principles: equality; mutual benefit; peaceful utilisation; openness and win-win cooperation; inclusive participation; shared development; international scientific exchange; and shared access for all interested partners.[28] Seventeen states (13 public announcements), international organisations, and over 50 global research institutions have joined the ILRS.[29]

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24 "International Participation in Artemis – An Update from NASA," U.S. Department of State, October 13, 2020, https://2017-2021.state.gov/briefings-foreign-press-centers/international-participation-in-artemis-an-update-from-nasa/.

25 "Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes," U.S. Department of State, accessed April 20, 2025, https://www.state.gov/bureau-of-oceans-and-international-environmental-and-scientific-affairs/artemis-accords.

26 "JOINT STATEMENT Between CNSA And ROSCOSMOS Regarding Cooperation for the Construction of the International Lunar Research Station", CNSA, April 29, 2021, https://www.cnsa.gov.cn/english/n6465668/n6465670/c6811967/content.html.

27 Deng Xiaoci, "China Advances Planning of International Lunar Research Station, on Track to Implement Chang'e-7, Chang'e -8 Lunar Probe Missions: Chief Designer", Global Times, April 23, 2025, https://www.globaltimes.cn/page/202504/1332711.shtml.

28 "International Lunar Research Station (ILRS) Guide for Partnership," CNSA, June 16, 2021, https://www.cnsa.gov.cn/english/n6465652/n6465653/c6812150/content.html.

29 "CNSA: International Lunar Research Station Attracts More Partners", CHINA SCIO, 24 April 2025, http://english.scio.gov.cn/chinavoices/2025-04/24/content_117841556.html.

Astropolitics and Alliance Membership

China and the US are actively recruiting members for their respective astropolitical alliances globally; it took three years for South Asian states to become signatories to either of these alliances. India became a signatory to the Artemis Accords in June 2023.[30] The same year, Pakistan joined China's ILRS in October.[31] India's decision to embrace the Artemis Accords was geopolitically significant because, for years, it had advocated for a multilaterally negotiated, legally binding framework for global space governance.[32] India's membership could be rationalised based on years of deepening cooperative relations with the US across all domains; however, the case of Bangladesh was more surprising.

In April 2025, Bangladesh joined the Artemis Accords, with the signing ceremony symbolically taking place in the capital, Dhaka. The acting administrator of NASA, Janet Petro, reflected on the agreement by implying that the Artemis Accords would determine the future of space exploration.[33] This development was a setback for China, as it had a long-standing space partnership with Bangladesh since 2006 and had become a founding member of the Asia Pacific Space Operation Organisation (APSCO), an international governmental organisation headquartered in Beijing, which was established to promote multilateral space cooperation.[34] Therefore, the fact that Bangladesh signed on to the Artemis Accords over the ILRS underscores that even some of China's traditional space allies are more attracted to the US' vision regarding the future of space exploration.[35]

30 Claire A. O'Shea, “NASA Welcomes India as 27th Artemis Accords Signatory,” NASA, June 23, 2023, https://www.nasa.gov/news-release/nasa-welcomes-india-as-27th-artemis-accords-signatory/.

31 Huaxia, “Pakistan, Belarus Join International Lunar Research Station Program”, Xinhuanet, October 25, 2023, https://english.news.cn/20231025/197ca42b8ae24ed6b1b4e5fba949fdbc/c.html.

32 Rajeswari Pillai RAJAGOPALAN, “India-US Space Cooperation Gets a New Fillip | Asia-Pacific Leadership Network”, APLN, September 11, 2025, https://www.apln.network/news/member_activities/india-us-space-cooperation-gets-a-new-fillip.

33 Jennifer M. Dooren, “NASA Welcomes Bangladesh as Newest Artemis Accords Signatory,” NASA, April 8, 2025, https://www.nasa.gov/news-release/nasa-welcomes-bangladesh-as-newest-artemis-accords-signatory/.

34 “The People’s Republic of Bangladesh”, APSCO, accessed April 20, 2025, http://www.apsco.int/html/comp1/content/Bangladesh/2018-06-25/14-146-1.shtml.

35 Morin and Tepper, “The Empire Strikes Back.”

It is noteworthy that several countries from the Global South are also signatories to the Artemis Accords, despite China's international campaigning primarily focusing on recruiting countries from the Global South to join the ILRS.[36] China has also established the ILRS Cooperation Organisation with the primary mandate of promoting international space cooperation and attracting states to participate in the ILRS.[37] Furthermore, China has multiple regional space corporation forums in Africa, Asia, and Latin America.[38] However, despite undertaking numerous initiatives to increase ILRS membership, it appears that the ILRS has yet to achieve the international buy-in that the Artemis Accords have.

The Artemis Accords crossed the astropolitical rubicon when the alliance acquired more than 50 member states in 2025, surpassing China's publicly stated goal of partnering with 50 states on the ILRS. Mike Gold, a former NASA official who played a key role in formulating the Artemis Accords, noted that obtaining more than 50 signatories was a significant milestone, as a majority of members in the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) had joined, which would enhance the normative influence of the Artemis Accords over non-signatories.[39] A leading US space official argued that the increasing membership of the Accords was a testament to the recognition and international acceptance of their values and principles.[40] However, in April 2025, China's chief designer of its lunar exploration programme, Wu Weiren, hinted at US interference with Beijing's efforts to cooperate with Europe and other foreign partners in space programmes. [41]

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36 "China to Include More African Members in its Lunar Research Program in Latest Effort to Boost South-South Cooperation," Global Times, September 5, 2024, https://www.globaltimes.cn/page/202409/1319316.shtml.

37 "Lunar Space Cooperation Initiatives," Secure World Foundation, January 29, 2025, https://www.swfound.org/publications-and-reports/lunar-space-cooperation-initiatives.

38 Deng Xiaoci, "China Facilitates Developing Nations to Learn about Space Exploration," Global Times, April 24, 2024, https://www.globaltimes.cn/page/202404/1311203.shtml.

39 Marcia Smith, "Gold: With 52 Members, Artemis Accords Now Represent Global Consensus", Space Policy Online, Updated December 21, 2024, https://spacepolicyonline.com/news/gold-with-52-members-artemis-accords-now-represent-global-consensus/.

40 Roxana Bardan, "Artemis Accords Reach 50 Signatories as NASA Welcomes Panama, Austria'," NASA, December 11, 2024, https://www.nasa.gov/news-release/artemis-accords-reach-50-signatories-as-nasa-welcomes-panama-austria/.

41 Eduardo Baptista, "China Lunar Chief Accuses US of Interfering in Joint Space Programmes with Other Nations," Reuters, April 23, 2025, https://www.reuters.com/business/media-telecom/china-lunar-chief-accuses-us-interfering-joint-space-programmes-2025-04-23/.

Factors Influencing Alliance Membership

The decision of the states to align with astropolitical alliances has been influenced by multifaceted considerations. Generally, the choice between joining either coalition has not been determined by idealistic notions of space exploration, but rather it has reflected deeper geopolitical and economic imperatives. In the case of the Artemis Accords, it can be argued that states have joined this alliance to pursue three core objectives. Firstly, they have been attracted by the promise of becoming integrated into the Western supply chains of space infrastructure, which is dominated by the massive commercial space sector in the US. Secondly, they have signed on to secure a favourable position in the future space economy by being able to engage in lunar resource extraction.[42] Thirdly, for traditional US allies, enhancing space cooperation became an extension of conventional defense partnerships.[43] Conversely, states that have joined the ILRS have partly done so from a position of geopolitical resistance to US hegemony. For example, in the case of Russia, it provides an opportunity to transition away from its participation in the ISS and divert resources to the ILRS. Other member states have viewed participation in the ILRS as an opportunity to acquire access to advanced space capabilities from China and reinforce historic space ties, as in the case of Pakistan.

Alliance Membership and Dependency Risks

The implications for states in joining either alliance are not limited to acquiring technological or economic benefits; there is also the risk of creating long-term dependencies that will adversely affect the strategic autonomy of member states. For instance, states may gain access to the US space infrastructure by joining the Artemis Accords. However, the interoperability standards for communication protocols or docking systems could keep them tethered to the US. It could lead to path dependencies limiting flexibility in future space operations. This predicament is underscored by how European states have become heavily dependent on the Artemis programme to help fulfil their lunar ambitions.[44]

Many Artemis partners lack indigenous capabilities for lunar landing or orbiting. Hence, European partners, such as Italy and the UK, are investing heavily in NASA-led lunar gateway projects; their upcoming lunar modules are designed for

42 Swaim Prakash Singh, “Why Nations are Rallying Behind the Artemis Accords”, CAPSS India, December 23, 2024, https://capssindia.org/why-nations-are-rallying-behind-the-artemis-accords/.

43 Christopher Newman, “Artemis Accords: Why Many Countries Are Refusing to Sign Moon Exploration Agreement,” The Conversation, October 19, 2020, http://theconversation.com/artemis-accords-why-many-countries-are-refusing-to-sign-moon-exploration-agreement-148134.

44 Peggy Hollinger and Clive Cookson, “Europe”s Moon Plans at Risk as Trump Team Reviews Nasa's Artemis Project”, Financial Times, February 20, 2025, https://www.ft.com/content/e14e3a07-3b5f-447e-a190-04955bb71dae.

exclusive integration with Artemis infrastructure. The Artemis Accords also require members to align their space policy, operational safety zones, and data-sharing practices with US-authored frameworks. This has already led to harmonisation of national space regulatory environments (e.g., Australia's updated Space Activities Act and Luxembourg's space mining regime), orienting them toward US legal and operational precedents.

Furthermore, the Artemis Accords include countries such as Luxembourg, the UAE, and Romania, whose national space budgets are less than 2 per cent of NASA's annual budget. For instance, NASA's annual budget for Artemis is more than ten times the United Arab Emirates' (UAE) National Space Fund, which is 820 million USD.[45] This stark disparity means that smaller Artemis signatories are highly dependent on NASA for launch opportunities, lunar mission seats, and data access etc. Meanwhile, partners of the ILRS could encounter similar difficulties and trade-offs. They could face restricted access to Western space technology and potentially face secondary sanctions on their collaborative space projects with China or Russia. Hence, establishing space partnerships with the ILRS could make it harder for developing states to participate in Western space projects and vice versa. Therefore, states face a dilemma when signing on to either alliance because their membership would require them to choose between only one of two options that might not best serve their foreign policy interests.

Fragmented Astropolitical Order

Most states have not signed both accords; joining one alliance often means conforming to that group's rules and risking exclusion from the other. As of July 2025, only seven countries had formal memoranda or partnership agreements with both groupings, and none have engaged in parallel deep-technology development with either alliance due to divergent technology and IP standards, as well as mutual exclusivity clauses in several agreements. As noted in the preceding section, the Artemis Accords' standardisation and the US Wolf Amendment bar bilateral cooperation between NASA and Chinese institutions.

So, once a state becomes embedded in the Artemis network, its institutional and commercial partners would face legal roadblocks when engaging with ILRS-related Chinese or Russian ventures. This underscores that participation in one alliance can institutionally constrain access to rival alliances' technologies or data, as formal agreements and national legislation prohibit dual engagement. A 2025 RAND report reinforces this viewpoint by noting how such commitments create

[45] Murdo Morrison, "How UAE Is Making the Case for Space", Flight Global, November 13, 2023, https://www.flightglobal.com/aerospace/how-uae-is-making-the-case-for-space/155803.article.

path dependencies that diminish member states' ability to pursue alternative space partnerships or technological standards independently.[46]

It is noteworthy that US officials have stated that there are no inherent restrictions preventing any state from participating in the ILRS and signing the Artemis Accords simultaneously.[47] On paper, the Artemis Accords and the ILRS charters are not mutually exclusive. Instead, they stress absolute gains arising from international space cooperation. Except for the principle of transparency, the guidelines in both frameworks are broadly consistent. Some observers in the international community thereby hold an optimistic perspective regarding the possibilities of inter-alliance cooperation.

Such optimism was substantiated in December 2024 when Thailand became the first state to participate in the ILRS while also being a signatory to the Artemis Accords.[48] A few other states have opted for hedging approaches to deal with this increasing astropolitical polarisation. The UAE has adopted a multidimensional space strategy by engaging with both frameworks at the national and sub-national levels.[49] However, hedging faces uncertainty regarding its sustainability, as the Sino-US space competition continues to intensify, which has reduced the prospects for significant inter-alliance cooperation in the future.[50]

Consequently, it is challenging for member states in both alliances to enhance bilateral space cooperation due to overarching structural constraints. For instance, India and Russia had a robust space partnership, and Russia even trained Indian astronauts. However, India had to forego two decades of space cooperation with Russia when it joined the Artemis Accord.[51] Similarly, Europe and China have frequently collaborated on space projects. The latest example is the European scientific devices integrated into China's Chang'e-6 lunar mission; there have also

46 Daniel M. Gerstein and Erin N. Leidy, Emerging Technology and Risk Analysis: The Space Domain and Critical Infrastructure (Santa Monica, California: RAND, 2025) https://www.rand.org/pubs/research_reports/RRA2875-1.html.

47 Jeff Foust, “Artemis Accords Lift Off”, The Space Review, June 17, 2024, https://www.thespacereview.com/article/4812/1.

48 Roxana Bardan, “NASA Welcomes Thailand as Newest Artemis Accords Signatory,” NASA, December 16, 2024, https://www.nasa.gov/news-release/nasa-welcomes-thailand-as-newest-artemis-accords-signatory/.

49 Andrew Jones, “Emirati University Signs up to China's Moon Base Project,” SpaceNews, November 20, 2023, https://spacenews.com/emirati-university-signs-up-to-chinas-moon-base-project/.

50 Aaron Bateman, “The Prospects for United States–China Space Cooperation are Limited,” Bulletin of the Atomic Scientists, June 12, 2023, https://thebulletin.org/2023/06/the-prospects-for-united-states-china-space-cooperation-are-limited/.

51 Ajey Lele, “India and the Artemis Accords: Need to Tread Cautiously,” National Security 6, no. 4, (2023):235-51, https://doi.org/10.32381/NS.2023.06.04.1.

been several joint astronaut training programs between the Chinese and European Space agencies.[52]

However, Karl Bergquist, Head of the European Space Agency's (ESA) International Relations Department, stated last year that rising geopolitical tensions are hindering future space cooperation between China and the ESA.[53] These tensions have stemmed from US efforts to convince allies to roll back space cooperation with China, just as it barred them from establishing technological partnerships, as evident by the geopolitics of 5G.[54] As a result of US pressure and rising sanctions on China and Russia, Karl Bergquist emphasised that it might become 'impossible' for ESA to cooperate with China on the ILRS.[55]

Consequently, states now face diminishing opportunities to opt for multivector space cooperation with the US and China, as astropolitical divisions continue to become more rigid over time. Consequently, the formation of astropolitical alliances would create new technological barriers, resulting in standard inconsistencies, incompatible lunar habitats, divergent resource extraction technologies, and independent communication and technological ecosystems on the moon, which would create additional challenges for joint mission operations and emergency response coordination.

Astropolitical Alliances and Tensions with the OST

The Outer Space Treaty (OST) is the bedrock of international space law, which has survived periods of contentious geopolitical strife. However, the rapid commercialisation of space over the past five years and the formation of astropolitical alliances present the greatest challenge to the treaty, which has stood the test of time over the past 50 years. This challenge stems from the fact that the provisions of the OST regarding resource extraction and territorial claims on

52 Chi WANG and Quanlin FAN, "Review of 2024 Global Space Science Activities," Science & Technology Review 43, no. 1 (2025): 32-46, http://www.kjdb.org/EN/10.3981/j.issn.1000-7857.2024.12.01769.

53 Andrew Jones "ESA-China Moon Cooperation Could End with Chang'e-6," SpaceNews, June 12, 2024, https://spacenews.com/esa-china-moon-cooperation-could-end-with-change-6/.

54 Mustafa Bilal, "5G Geopolitics: Securitisation, Sino-US Contention and Technological Dependence for Developing States," Journal of Aerospace & Security Studies III (2024): 97-121, https://www.jassjournal.casstt.com/wp-content/uploads/2025/01/4-Mustafa-Bilal-Geo-Pol-5G-JASS-Vol3-HM1-ED-SSA-WEB.pdf.

55 Jones, "ESA-China Moon Cooperation Could End with Chang'e-6."

celestial bodies are now being questioned as the feasibility of space mining has increased.[56]

Additionally, the legal framework of the Artemis Accords is both adaptive and subversive. Although the Artemis Accords affirm compliance with the OST, they reinterpret the treaty's prohibition on appropriating celestial resources by establishing provisions for resource extraction.[57] Consequently, the accords have been criticised for undermining the Global Commons ethos of the OST.[58] China and Russia have vehemently argued against the Accords for violating the treaty's spirit.[59] Yet, their non-binding framework, combined with the rate at which states are signing on to them, suggests a normative shift towards customary international law to normalise the extraction and ownership of celestial resources.

Section 11 of the Accords envisions the establishment of safety zones, which would be exclusive areas surrounding operational sites, designed to prevent interference during the extraction of resources or the conduct of scientific experiments. What is concerning is how contentious safety zone provisions could paradoxically also lead to inter-alliance conflict. While these provisions are deemed operational necessities, they can be used to justify the acquisition of territorial control. A prominent historical precedent exists regarding how peaceful naval exclusion zones can incite conflict over water resources.[60] This highlights the risk of inter-alliance conflict over lunar resources in the absence of a consensus on the rights to lunar resources.

Thus, the competing interpretations of the OST could create a legally grey area where both alliances could proceed with competing plans for extracting lunar

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56 Alexia Armstrong, “Equity in the Space Frontier: The Laws of Commercial Space Mining, and Solutions for Common Benefit and Sustainability,” Canadian Bar Association, September 11, 2024, https://www.cba.org/sections/air-and-space-law/resources/equity-in-the-space-frontier-the-laws-of-commercial-space-mining-and-solutions-for-common-benefit/.

57 Inesa Kostenko, “Artemis Accords and the Future of Space Governance: Intentions and Reality,” Advanced Space Law 8, (2021): 40-50, https://doi.org/10.29202/asl/8/4.

58 Kiran Mohan Vazhapully, “Space Law at the Crossroads: Contextualizing the Artemis Accords and the Space Resources Executive Order”, OpinioJuris, July 22, 2020, https://opiniojuris.org/2020/07/22/space-law-at-the-crossroads-contextualizing-the-artemis-accords-and-the-space-resources-executive-order/.

59 Almudena Azcárate Ortega, “Artemis Accords: A Step Toward International Cooperation or Further Competition?” Lawfare, December 15, 2020, https://www.lawfaremedia.org/article/artemis-accords-step-toward-international-cooperation-or-further-competition.

60 Andrew Jones, “'We’re in a Space Race.’ NASA Chief Says US ‘better watch out’ for China’s Moon Goals,” Space.com January 5, 2023, https://www.space.com/nasa-bill-nelson-china-space-race-moon.

resources. The risk of conflict is further exacerbated by the fact that both alliances are targeting the establishment of bases on the resource-rich Lunar South Pole to ensure long-term space operations by extracting Helium-3 and water ice.[61] However, the region could become a lunar flashpoint, drawing parallels with the geopolitical contestation over resource-rich terrestrial flashpoints, such as the South China Sea.[62]

Lastly, while the Artemis Accords and ILRS emphasise environmental sustainability in space, neither framework has sufficient safeguards to reduce the environmental consequences of commercial lunar activities. Mining operations planned for lunar resources could create dust storms by disturbing the sensitive balance of lunar regolith. Expanding commercial activities on the Moon could also create obstacles to ongoing civil scientific research due to the lack of a worldwide agreement on ethical rules for extracting lunar resources. If commercial interests surpass environmental protection, the Moon will become a replica of terrestrial ecological degradation.

Establishing a Pragmatic Space Governance Framework

Broad international acceptance has not occurred for purely idealistic space governance frameworks, such as the Moon Agreement. A pragmatic balance should be struck between commercial space interests and the principles of equity and justice. Space governance needs a sustainable and equitable model to replace the emerging framework, which could be highly exploitative. To this end, the established global commons principle could form the conceptual basis for establishing an institutional oversight body. This could take the shape of governance structure modelled after the Antarctic Treaty System and the International Seabed Authority, which manage global commons such as Antarctica and the seabed. By enabling open resource licensing, this body could promote pragmatic lunar mining practices rather than idealistic norms.[63]

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61 Doaa Abdel-Motaal, “Deconflicting Activities in New Frontiers: The Moon versus Antarctica”, The Strategist, August 8, 2024, https://www.aspistrategist.org.au/china-could-stake-a-claim-on-the-moon-just-look-at-what-its-doing-in-antarctica/.

62 Matthew Gross, “The Artemis Accords: International Cooperation in the Era of Space Exploration,” Harvard International Review, 27 January, 2023, https://hir.harvard.edu/the-artemis-accords/.

63 Thomas Lord, “The Antarctic Treaty System and the Peaceful Governance of Antarctica: The Role of the ATS in Promoting Peace at the Margins of the World,” The Polar Journal 10, no. 1 (2020): 3–21, https://doi.org/10.1080/2154896X.2020.1757821.

Moreover, both China and the US should negotiate on cooperative procedures regarding the size, scope, nature, and dispute settlement measures related to the controversial safety zones.[64] To this end, middle powers and regional space agencies should also utilise their diplomatic leverage to mediate between China and the US and advocate for a pragmatic space governance framework. They could also work to establish common technical standards between alliances while promoting scientific partnerships.[65]

Similarly, states that enjoy cordial relations with China and the US could diplomatically strive to establish a shared working group between the two alliances to prepare for joint rescue missions under the Rescue Convention.[66] Such initiatives could help foster trust and cooperation between the two partnerships while clearing misperceptions. However, to achieve such aspirational goals, states in both alliances must view space as the final frontier of international cooperation, not just of competition.

Conclusion

The formation of astropolitical alliances marks a fundamental shift in space governance, where the interaction of institutional structures, power struggles, and normative competition will determine humanity's future in space. The study underscores that the Artemis Accords and ILRS are competing frameworks in which material interests (realism), cooperative mechanisms (liberalism), and legitimising narratives (constructivism) dynamically converge.

The Artemis framework establishes neoliberal institutional pathways that bind partners through technological dependencies, as evidenced by Europe's reliance on Artemis infrastructure, while also advancing US strategic dominance through exclusionary practices, such as the Wolf Amendment. On the other hand, the ILRS positions itself as an anti-hegemonic alternative by utilising China's 'shared destiny' discourse. The conflict between structural power constraints and institutional flexibility is reflected in the increasing astropolitical bifurcation, even as middle powers like Thailand and the UAE try hedging strategies.

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64 Mingyan Nie, "Legal Measures to Preserve Lunar Security and Safety in the Context of China–US Competition to the Moon: An Appraisal from China's Perspective", Leiden Journal of International Law (2025): 1–23, https://doi.org/10.1017/S0922156525100277.

65 Adrian Flynn, "Star-Bound and Star-Crossed: A Path to U.S.-China Space Cooperation Through Science Diplomacy," Astropolitics 22, no. 1–2 (2024): 43–68, https://doi.org/10.1080/14777622.2024.2368599.

66 Dan Hart, "The Case for the United States and China Working Together in Space," Atlantic Council, August 14, 2024, https://www.atlanticcouncil.org/blogs/new-atlanticist/the-case-for-the-united-states-and-china-working-together-in-space/.

The breakdown of the fundamental norms of the Outer Space Treaty also demonstrates this synthesis. The provision of safety zones by Artemis, a practical operational solution (liberal institutionalism), also permits de facto territorial control (realist power projection), which is normalised by the discursive reinterpretation of the extraction of celestial resources (constructivist norm). This could create a precarious legal environment where conflicting interpretations could intensify into conflict, especially at the resource-rich Lunar South Pole, which is targeted by both alliances as a strategic landing zone.

Looking ahead, there are several possible trajectories for the future of astropolitical alliances. Incompatible technical standards and flashpoints such as the Lunar South Pole could lead to a bifurcated astropolitical order if competition for lunar resources intensifies. However, if middle powers mediate resource-sharing models inspired by the Antarctic Treaty, a pragmatic coexistence could emerge.

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