frontiers | Frontiers in Space Technologies

TYPE Brief Research Report
PUBLISHED 20 October 2025
DOI 10.3389/frspt.2025.1664300

OPEN ACCESS

EDITED BY
Upasana Dasgupta,
O. P. Jindal Global University, India

REVIEWED BY
Joseph N. Pelton,
International Space University, United States
Kuan Yang,
Beijing Institute of Technology, China

*CORRESPONDENCE
Carla P. Freeman,
freeman.carla@gmail.com,
cfreeman5@jhu.edu

RECEIVED 11 July 2025
ACCEPTED 06 October 2025
PUBLISHED 20 October 2025

CITATION
Freeman CP (2025) The impact of US-China strategic competition on the idea of space as a "global commons".
Front. Space Technol. 6:1664300.
doi: 10.3389/frspt.2025.1664300

The impact of US-China strategic competition on the idea of space as a "global commons"

Carla P. Freeman*

Johns Hopkins University School of Advanced International Studies, Washington, DC, United States

This article examines how US-China's strategic competition is transforming the conceptualization of outer space as a "global commons." While the global commons framework for space governance emerged from Cold War-era agreements emphasizing universal access, freedom of exploration and non-appropriation of outer space, contemporary geopolitical rivalry has fundamentally altered how the world's leading space powers interpret and apply this concept. The analysis traces the historical evolution of space as a global commons from the 1967 Outer Space Treaty through recent policy shifts by Beijing and Washington. The research documents a striking reversal: the United States, once a champion of characterizing space as a global commons, rejected this characterization in 2020. Conversely, China, which once rejected global commons terminology, now uses it to describe outer space. These competing approaches are crystallizing in rival lunar development programs, with the US-led Artemis initiative confronting the China-Russia International Lunar Research Station. The findings demonstrate how great power rivalry has upended the traditional normative frameworks countries have used to determine their policy for space.

KEYWORDS

global commons, outer space treaty (OST), US-China strategic competition, artemis accords, international lunar research station (ILRS), space governance, common heritage of humankind, space resources

Introduction

When humans begin to interact regularly with new environments, they use conceptual frameworks as the basis of the norms and rules they follow in those environments. These frameworks, which subsequently evolve, emerge from many logics, such as experiences in other environments perceived as analogous; the nature of the technologies used in the new environment; political, economic, and military competition among actors in the environment; and the preferences of the first or dominant actor in the given arena (Carver and Pikalo, 2008).

How outer space should be conceptualized as a human environment became the focus of debate as technologies emerged that made it possible for humans to contemplate establishing a regular presence in this new frontier. Key questions included how the space environment relates to the concepts of territorial sovereignty and the ownership of its resources. The dominant role in space played by the Soviet Union and the United States during the Cold War and by the United States in the post–Cold War period gave these powers exceptional influence over how outer space was conceptualized as a domain, setting the parameters for the way space would be used by later arrivals in space. As this article

explains, an early push for the territorialization of space was superseded by a conceptualization of space as beyond sovereignty.

Although the idea that, as an arena beyond the sovereign control of states, space is a global commons became widely accepted, what the term "global commons" itself means, however, was and remains contested. It is not a formal term in international law and does not appear in international treaties. It is most frequently applied in two distinct ways. One way is to reflect the status of the domain as beyond the sovereign jurisdiction of any state and to emphasize its universal accessibility (this article uses the term "free access"). The other way "global commons" is defined focuses on features associated with a "common pool" resource; among these are that it is "non-excludable" (i.e., excluding would-be users from exploiting these resource is not possible—a characteristic that aligns with the idea of universal accessibility to space) and "rivalrous," meaning that the use of the resource by an actor does reduce the amount of that resource for all (Graefrath and Jahn, 2024).

Since the number of new state and commercial actors in space has grown and the idea of space as a competitive arena to include war fighting has taken hold, the global commons concept for space has become enmeshed in geopolitical competition. Today's two leading space powers—the United States and the People's Republic of China (hereafter, China, PRC)—are at the forefront of this contest. As this article explains, their strategic objectives and technological advances in space increasingly reflect their intensifying competition on Earth and have spurred the development of rival conceptions of how the space environment should be accessed, controlled, and used. This rivalry is setting into relief long unresolved differences over the definition of a global commons as the concept is applied to outer space and appears on track to produce dueling paradigms for the relationship between human actors and space.

This article begins by discussing the history of the association of the term "global commons" with outer space. It then charts the evolution of the use of the term by Beijing and Washington and assesses the role and impact of US-China rivalry on these changes. It concludes by highlighting that while the United States is discarding the concept of space as a global commons, China is constructing a new definition of the global commons that reflects its own preferences for access to and the use of space.

Outer space as a global commons in historical perspective

As human access to space became technologically conceivable, the question of whether space was a global commons or a domain to be "territorialized" under states' sovereign control was increasingly debated. International thinking about outer space had tended toward a general preference for territorialization of space based on the 1944 Convention on International Aviation ("Chicago Convention"), which suggested that the territorial sovereignty of nation-states could extend above their territory into outer space. However, following the deployment of satellites, first by Moscow and then by Washington, thinking about outer space as national airspace changed dramatically. In the mid-1950s, as the two superpowers raced to place a manmade satellite in space, United States President Dwight D. Eisenhower proposed an "Open Skies" agreement with the Soviet Union that would allow both countries to engage in aerial observation of each other's territory, thereby boosting mutual confidence and enhancing strategic stability. Initially, as M. J. Peterson recounts, the Soviet Union, for national security reasons, embraced the idea of outer space as equivalent to airspace (Peterson, 1997). However, although Soviet Premier Nikita Khrushchev rejected Eisenhower's proposal, the Soviet launch of Sputnik 1, which passed over international territory during its orbit, proved a key step in aligning Moscow with the principle of freedom in space in international law (Polkowska, 2018).

The idea that satellites could orbit freely above the Earth reinforced the view that governance for outer space could draw fruitfully from international maritime rules and norms. Whereas national airspace was likened to territorial seas, outer space was seen as analogous to the high seas (Peterson, 1997). Not all governments deemed the analogy appropriate. For example, some equatorial states sought to extend sovereign control over geosynchronous orbit, but this position won limited traction. Scholar Jason Beery argues that space powers used the global commons frame in part because they had no desire to negotiate access to geostationary orbits with equatorial countries (Pic and Morin, 2023).

Before long, however, the Soviet Union changed its position and joined most other countries in being ready to draw parallels between the maritime and space arenas. The simile connected rules for outer space to the Grotian argument that, like the oceans whose expanse defied sovereign or private appropriation and thus rendered them naturally "free seas," so too, given outer space's vastness, should it be "free." Moreover, in the absence of the ability to exclude others, there could be no sovereignty. As Peterson describes, by the early 1960s, once Moscow was persuaded that it could embrace the free seas analogy and use international legal diplomacy to limit the scope of certain reconnaissance activities, it too supported the idea of freedom of exploration in space (Peterson, 1997). Soviet lawyers began to advocate for space as a zone that would be "freely accessible," with space understood, Soviet jurist Vladimir Koppal argued, as "res omnium communis governed by the principle of freedom of navigation which is excluded from the sovereignty of individual states" (Milun, 2011).

The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty, OST) appeared to demonstrate a broad international consensus that outer space constituted a global commons. The OST does not use the term "global commons" explicitly. However, its Article I declares the exploration and use of space to be "the province of all mankind" and states that "there shall be free access to all areas of celestial bodies " (Sittenfeld, 1980; Outer Space Treaty, 1967). In addition, Article II specifically forbids national appropriation by claims of sovereignty (Outer Space Treaty, 1967).

Nonetheless, different countries focused on different aspects of the global commons inferences in the OST. The two superpowers, which in 1967 remained the only countries with satellite launch technology even as the number and type of satellites were growing rapidly, prioritized freedom of access and use of outer space. This was not the case for most other nation-states, however (Vogler, 1995). Many emphasized the OST language labeling space as the "province of mankind" as an international commitment to ensuring

universal access and use. This distinction was a key element of the growing controversy over access to orbital positions and to advanced technologies that would enable the use of space by countries beyond the superpowers and wealthy countries from the Global North (Vogler, 1995).

To these two key conceptualizations of outer space as a global commons was added a third. The 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the "Moon Treaty") enshrined the idea that the Moon and other celestial bodies are the "common heritage of mankind" (Moon Agreement, 1979). Like the global commons concept, the ontology of the common heritage principle has its roots in the Roman legal doctrine of res communis, also reinforcing the principles of common use and nonappropriation. Moreover, the common heritage principle focuses on global commons as resource domains rather than as geophysical or strategic arenas. Crucially, it also challenges the idea that those who are the first to access resources in the commons can exploit them without regard to others. Common heritage thus means common property and is inherently focused on distributive equity rather than on access. This can be seen in the operationalization of the principle in international maritime law in the International Seabed Authority (ISA). The ISA is tasked with ensuring that the exploitation of the mineral resources of the deep seabed is carried out for the benefit of all humanity today and in the future, and that the proceeds from such exploitation are shared based on equity (International Seabed Authority, 2021).

As superpower rivalry gave way to United States dominance with the end of the Cold War, debates over whether and how the space arena should be conceptualized were relatively muted. Drastic budget constraints in the wake of the Soviet collapse weakened Russia's space capabilities (Vidal and Privalov, 2024). The United States faced little pushback against its emphasis on freedom of access and movement in space. In the United States National Space Policy of 1996, the Clinton administration emphasized the "right of passage through and operations in space without Interference." Over the next 2 decades, United States policy emphasized "freedom of action" for unhindered United States activities in space (Goehring, 2021).

A Chinese challenge to the space commons?

China had not been seen by the United States as a significant challenge to its space power until 2007. The debris-generating Anti-satellite weapon (ASAT) test China conducted that year not only was a strategic shock to the United States and its allies, demonstrating the threat China could pose to critical space assets, but was also seen as a test of the idea of outer space as an open access global commons in two respects. First, the debris cloud generated by the test was the largest field of space debris in history, endangering others' use of space and being seen by many observers as a painful example of the "tragedy of the commons" (Forden, 2007). Tokyo charged Beijing with violating Article IX of the OST, which commits ratifying countries to "avoid. . . harmful contamination" of outer space (Freeman, 2020). For Washington, the ASAT test showed that United States freedom of access to space was vulnerable to disruption by a rising power (Freeman, 2020).

The test occurred as China was adopting increasingly high-profile tactics to challenge the long-standing norm of applying the rules of high seas access to exclusive economic zones (EEZs). Many observers understandably concluded that China might seek to extend state sovereignty to outer space. These concerns were reinforced by reports that some Chinese military writings advocated that Beijing pursue territorial-style outer space control as part of integrated military air and space operations (Freeman, 2020). China's position on the scope of national jurisdiction over the governance of satellite transmissions, particularly the receipt of satellite signals related to "information sovereignty," within Chinese territory, was interpreted as further evidence that China might pursue the equivalent of "mare clausum" (or a sea closed to other states) to assert sovereign control of space (Freeman, 2020).

Reinforcing these concerns was China's own official position on the term "global commons" applied to space, as well as the maritime and polar spheres. The governments of other major powers—not only the United States but also Japan and member states of the European Union, among others—had long used the term "global commons" in official statements. However, China had rejected the concept on the grounds that the United States and its allies were using it to reinforce American hegemony and as an element of its effort to constrain Beijing's pursuit of sovereignty claims in its maritime periphery (Freeman, 2020). For the United States, these developments offered evidence that China was prepared to challenge international norms to pursue its own interests rather than act as what senior United States State Department official Robert Zoellick had in 2005 described as a "responsible stakeholder" (Freeman, 2020).

The United States' and China's shifting postures on space as a global commons

Xi Jinping came to power in China in 2012, and in the first few years thereafter, official PRC statements increasingly emphasized the importance of space to Chinese national security, broadly defined. China's 2015 white paper on military strategy designated space as a "new security domain," which, along with cyberspace, was described as the "new commanding heights in strategic competition" (State Council of the PRC, 2015). In 2014, China opened its military-led space sector to commercial actors as it began bolstering its military-civil fusion strategy, channeling significant flows of state capital to Chinese space start-ups with striking outcomes in terms of sheer numbers of new firms (Zhang, 2019). Beijing announced in 2015 that it had established a Strategic Support Force within the People's Liberation Army (PLASSF) to provide battlespace support for China in space, as well as in the cyber and electronic domains (Costello and McReynolds, 2019). China also expanded its international space cooperation. In addition to working with Moscow on space technology, Beijing expanded the number of countries using its military-civil BeiDou Satellite Navigation system, a rival to the United States global positioning system (He, 2023), among other potentially dual-use space-based services (Uppal, 2025).

While these developments in Chinese space policy were underway, United States policy was also shifting, heading in a direction that had direct repercussions for the United States

characterization of space as a global commons. In 2015, the United States Congress passed the Commercial Space Launch Competitiveness Act, establishing that a "U.S. citizen engaged in commercial recovery of an asteroid resource or a space resource shall be entitled to any asteroid resource or space resource obtained" (United States Congress, 2015). In 2020, President Trump reinforced the law, issuing an executive order titled "Encouraging International Support for the Recovery and Use of Space Resources." The order was striking with respect to its statement on space as a global commons, which read: "Outer space is a legally and physically unique domain of human activity, and the United States does not view it as a global commons" (The White House, 2020). Scott Pace, then the executive director of the United States National Space Council, underscored this position in an official speech, declaring: "Outer space is not a 'global commons,' not the 'common heritage of mankind,' not 'res communis,' nor is it a public good," noting that these concepts are not explicitly part of the OST (Fernholz, 2022). In tandem with these developments, the administration also explicitly rejected the Moon Agreement, which the United States had never endorsed, and explicitly opposed treating space resources under a "common heritage of mankind" framework (Milman, 2020).

The Trump administration's declaration that outer space was not a global commons also went hand in hand with its initiation of the Artemis Accords (AA). The AA, negotiated with the notable exclusion of China, seeks to build an international coalition around a common set of space principles for space extraction and utilization. It had been signed by 56 nations as of July 2025 (NASA, 2025). Some critics of the AA as a potential threat to space as an open access global commons argue that it does not provide clear regulatory guidelines for space corporations on space debris, adding to the risk that debris generated by commercial activities could impair access to space (Williams, 2024).

However, a major focus of debate over AA's impact on space as a commons is its proposal for "safety zones" aimed in principle at preventing "harmful interference" by countries against each other's space operations. Supporters of this concept argue that the AA clearly commits members to the OST's principle of free access to space. Skeptics worry that safety zones open the door to a lunar resources land grab and the territorialization of the space commons in contravention of the OST's non-appropriation principle and as well as their exploration and free access rights (Badreddine, 2024; Armagno et al., 2025). China has been among the critics, as one widely cited Chinese military and aerospace expert quoted in Chinese state media opined, the Artemis Accords are akin "to European colonial enclosure land-taking methods" (Deng, 2020).

The year 2020 also saw a dramatic shift in China's position on space as a global commons. As Di Mei, a member of the Shenzhen University law faculty, observes, beginning in late 2020, China began to translate a phrase that can mean global commons (全球公域, quanqiu gongyu) into English in terms very close to "global commons." In December that year, for example, China's Foreign Ministry spokesperson made remarks in which "space" was translated as "one of the" "global public domains." In 2022, the Foreign Ministry spokesperson described space using a phrase translated as "global public sphere" (Mei, 2024). That Beijing had more fully adopted the global commons concept for space was made clear when in 2024, in the English version of official remarks, China's UN Ambassador Fu Cong stated that "outer space is a global commons that bears on the security and wellbeing of all humankind," and that "outer space has become a global commons where the interests of all countries are intertwined with a common stake" (Fu, 2024).

The about-face in Beijing's position on its own official use of the term "global commons" followed the United States rejection of the global commons framing for outer space, but did it follow from it? It can be argued that the Trump administration's rejection of the global commons designation for space in effect left the concept up for grabs, and China seized the opportunity to embrace it. Doing so has several benefits for China. First, it allows China to cast itself as the champion of the principles of universal access to and use of space as a shared resource domain–while characterizing the United States as the self-interested enemy of those principles (Yang, 2017). At the same time, however, it also serves China's effort to promote Xi's signature concept of the "community of common destiny" as the basis for a new "framework" for international relations and global governance (National People's Congress of the People's Republic of China, 2018). In the context of space, Beijing has associated the language of "common destiny" with as yet undefined concepts of "open development in space" and "space for all." As military analysts point out, China's development of counterspace capabilities evidence a desire to be able to deny other nations access to space (Cohen et al., 2023).

Conclusion: shooting for the moon?

China's efforts to burnish its own credentials as a champion of space as a shared resource domain to which all countries have rights of access and development, while criticizing the United States, have extended to the Moon. In 2021, while the United States was trying to broaden international support for the Artemis Accords, China and Russia announced plans to jointly construct an International Lunar Research Station (ILRS) on the Moon, asserting that it would preserve the principles enshrined in the OST (Dou, 2021). The then Biden administration responded that the ILRS was an effort to assert norms of sovereignty over space assets (Duehring, 2023).

How the development of lunar resources will play out in the long term is impossible to predict, given the shifts described in this article in China's and the United States' positions on the idea of outer space as a global commons. Significantly, the first Trump administration's rejection of the global commons concept was not overturned by the Biden administration, pointing to a consensus in Washington on the issue. The second Trump administration has since indicated, moreover, that it will initiate plans for a United States nuclear base on the Moon, in order to "get there first and claim that for America," to quote Acting NASA Administrator Sean Duffy (Cullerton, 2025).

For its part, China seems certain to continue to seek to garner support for its definition of global commons as it pursues its preferred approach to space governance. Some experts assess that China could support legal interpretations of the AA as largely consistent with the OST and its interests. However, given the AA's United States provenance, in the context of US-China competition–and its own exclusion from the AA in any case—it seems more likely that Beijing will pursue a competing framework (Weeden, 2023). It appears probable that this will center on the ILRS, for which China has led diplomatic efforts since Russia's invasion of Ukraine (Jones, 2024). Whether other spacefaring, emerging spacefaring, or space-aspiring nations will take a side

and pick either the United States or a Chinese framework–or will do so based on security considerations–remains to be seen. North Atlantic Treaty Organization (NATO) member Turkey has announced its intention to participate in the ILRS and appears unlikely to join the AA (Ling, 2024). United States ally Thailand has signed onto the AA and also signed a memorandum of cooperation with the ILRS, among the 15 or so countries that have done so--although not all have publicly confirmed their sign on. Senegal's Space Studies Agency signed an agreement on cooperation on the ILRS in September 2024 and in July 2025 also joined the AA (Feldscher, 2025).

In the meantime, as China and the United States compete in space, the prospect of a property rights regime for space being widely adopted remains remote. In the absence of clear rules for resource extraction, whichever actor—whether the United States or China, whether a government agency or a corporation—takes the first steps toward a property rights regime for space may either establish new norms that pose a challenge to the existing regime for space or may usher in unregulated competition over space resources and services and precipitate a new tragedy of the commons (Rausser et al., 2023).

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

CF: Writing – original draft, Writing – review and editing.

Funding

The author(s) declare that no financial support was received for the research and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Generative AI was used in the creation of this manuscript.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

Publisher's note

References

Armagno, N. M., Harman, J., and Brimmer, E. D. (2025). "Securing space: a plan for U.S. action," in *Task force report no. 82*. Washington, DC, United States: Council on Foreign Relations. Available online at: https://www.cfr.org/task-force-report/securing-space/recommendations (Accessed September 3, 2025).

Badreddine, H. (2024). Safety zones: a legally backed concept or an attempt to colonize space? *ANZSIL Perspect*. Available online at: https://anzsilperspective.com/safety-zones-a-legally-backed-concept-or-an-attempt-to-colonize-space (Accessed September 4, 2025).

Carver, T., and Pikalo, J. (2008). *Political language and metaphor: interpreting and changing the world* (New York, NY: Routledge).

Cohen, R. S., Kepe, M., Beauchamp-Mustafaga, N., Clark, A., Conn, K., Grisé, M., et al. (2023). *Assessing the prospects for great power cooperation in the global commons*. Santa Monica, CA, United States: RAND Corporation. Available online at: https://www.rand.org/pubs/research_reports/RRA597-4.html (Accessed June 6, 2025).

Costello, J., and McReynolds, J. (2019). "China's strategic support force: a force for a new era," in *Xi remakes the PLA* (Washington, DC, United States: National Defense University Press). Available online at: https://ndupress.ndu.edu/Media/News/News-Article-View/Article/1748555/chinas-strategic-support-force-a-force-for-a-new-era (Accessed September 4, 2025).

Cullerton, B. (2025). Trump administration wants nuclear plant on moon by 2030. Available online at: https://www.live5news.com/2025/08/13/trump-administration-wants-nuclear-plant-moon-by-2030 (Accessed September 4, 2025).

Deng, X. (2020). Trump administration's 'Artemis Accords' expose political agenda of moon colonization, show cold War mentality against space rivals: observers. *Glob. Times* (May 7). Available online at: https://www.globaltimes.cn/content/1187654.shtml (Accessed June 9, 2025).

Dou, E. (2021). China and Russia to open moon base, expanding space cooperation. Available online at: https://www.washingtonpost.com/world/asia_pacific/china-russia-moon-base-space/2021/03/10/aa629748-8186-11eb-be22-32d331d87530_story.html (Accessed June 9, 2025).

Duehring, K. (2023). Can China claim the moon? The legal background of sovereign appropriation of territory in space. *SCBC Law*. Available online at: https://www.scbc-law.org/post/can-china-claim-the-moon-the-legal-background-of-sovereign-appropriation-of-territory-in-space (Accessed June 7, 2025).

Feldscher, J. (2025). ILRS member Senegal joins artemis accords. *Payload* (July 24). Available online at: https://payloadspace.com/senegal-becomes-2nd-ilrs-member-to-join-artemis-accords/ (Accessed September 4, 2025).

Fernholz, T. (2022). Space is not a 'global commons,' top trump space official says. *Quartz* (July 20). Available online at: https://qz.com/1159540/space-is-not-a-global-commons-top-trump-space-official-says (Accessed June 8, 2025).

Forden, G. (2007). After China's test: time for a limited ban on anti-satellite weapons. Arms Control Today. *Arms Control Assoc*. Available online at: https://www.armscontrol.org/act/2007-04/features/after-chinas-test-time-limited-ban-anti-satellite-weapons (Accessed August 2, 2025).

Freeman, C. (2020). An uncommon approach to the global commons: interpreting China's divergent positions on maritime and outer space governance. *China Q.* 24, 1–21. doi:10.1017/S0305741019000730

Fu, C. (2024). *Remarks by ambassador Fu Cong at the UN security council on the draft resolution on outer space security*. New York, NY, United States: Permanent Mission of the People's Republic of China to the UN. Available online at: http://un.china-mission.gov.cn/eng/hyyfy/202404/t20240425_11288792.htm (Accessed June 7, 2025).

Goehring, J. (2021). Why isn't outer space a global commons? *J. Natl. Secur. Law & Policy* 11, 3. Available online at: https://jnslp.com/wp-content/uploads/2021/09/Why_Isnt_Outer_Space_a_Global_Commons_2.pdf (Accessed June 6, 2025).

Graefrath, M. S., and Jahn, M. (2024). Political spaces beyond the nation state: the global commons in international security studies. *Glob. Stud. Q.* 4, ksae087. doi:10.1093/isagsq/ksae087

He, Q. (2023). China-russia technology cooperation in space: mutually needed or mutually exclusive? *Pac. Rev.* 36, 897–926. doi:10.1080/09512748.2022.2052744

International Seabed Authority (2021). Equitable sharing of financial and other benefits from deep-seabed mining. *ISA Tech. Study*. Available online at: https://www.isa.org.jm/wp-content/uploads/2022/06/ISA_Technical_Study_31.pdf (Accessed September 4, 2025).

Jones, A. (2024). China wants 50 countries involved in its ILRS moon base. *Space news*. (July 23). Available online at: https://spacenews.com/china-wants-50-countries-involved-in-its-ilrs-moon-base (Accessed September 4, 2025).

Ling, X. (2024). Nato member Turkey seeks to join China-Russia moon project instead of US-led artemis programme: reports. *South China Morning Post*. (April 11). Available online at: https://www.scmp.com/news/china/science/article/3258624/nato-member-turkey-seeks-join-china-russia-moon-project-instead-us-led-artemis-programme-reports (Accessed September 4, 2025).

Mei, D. (2024). Integrating outer space as a global commons with private property rights to outer space resources. *Front. Space Technol.* 5, 1351850. doi:10.3389/frspt.2024.1351850

Milman, O. (2020). Trump order encourages US to mine the moon. *Guard.* (April 7). Available online at: https://www.theguardian.com/us-news/2020/apr/07/trump-mining-moon-executive-order (Accessed June 7, 2025).

Milun, K. (2011). *The political uncommons: the cross-cultural logic of the global commons*. 1st ed. Oxon, OX, United States: Routledge. doi:10.4324/9781315237725

Moon Agreement (1979). Agreement governing the activities of states on the moon and other celestial bodies. *U. N. Office Outer Space Aff.* Available online at: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html (Accessed June 25, 2025).

Morin, J., and Tepper, E. (2023). The empire strikes back: comparing US and China's structural power in outer space. *Glob. Stud. Q.* 3, ksad067. doi:10.1093/isagsq/ksad067

NASA (2025). The Artemis accords. Available online at: https://www.nasa.gov/artemis-accords/ (Accessed June 6, 2025).

National People's Congress of the People's Republic of China (2018). Amendment to the constitution of the People's Republic of China. Available online at: http://www.xinhuanet.com/politics/2018lh/2018-03/11/c_1122521235.htm (Accessed June 6, 2025).

Outer Space Treaty," Treaty on principles governing the activities of states in the exploration and use of outer space, including the moon and other celestial bodies. (1967). Available online at: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html (Accessed: September 4, 2025).

Peterson, M. J. (1997). The use of analogies in developing outer space law. *Int. Organ.* 51 (2), 245–274. doi:10.1162/002081897550357

Pic, P., Evoy, P., and Morin, J.-F. (2023). Outer space as a global commons: an empirical study of space arrangements. *Int. J. Commons* 17 (1), 288–301. doi:10.5334/ijc.1271

Polkowska, M. (2018). Limitations in the airspace sovereignty of states in connection with space activity. *Secur. Def. Q.* 20, 42–56. doi:10.5604/01.3001.0012.5151

Rausser, G., Choi, E., and Bayen, A. (2023). Public–private partnerships in fostering outer space innovations. *Proc. Natl. Acad. Sci.* 120, e2222013120. doi:10.1073/pnas.2222013120

Sittenfeld, L. (1980). The evolution of a new and viable concept of sovereignty for outer space. *Fordham Int. Law J.* 4, 1. Available online at: https://ir.lawnet.fordham.edu/ilj/vol4/iss1/9 (Accessed June 6, 2025).

State Council of the PRC (2015). China's military strategy (full text). Available online at: https://english.www.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm (Accessed June 6, 2025).

The White House (2020). Encouraging international support for the recovery and use of space resources. *Fed. Regist.* (April 6). Available online at: https://www.federalregister.gov/documents/2020/04/10/2020-07800/encouraging-international-s (Accessed September 4, 2025).

United States Congress (2015). U.S. commercial space launch competitiveness act, public Law 114–90. Available online at: https://www.congress.gov/114/plaws/publ90/PLAW-114publ90.pdf (Accessed September 4, 2025).

Uppal, R. (2025). *China's escalating space militarization: assessing destructive 'counter-space' capabilities and weapons advancements*. Newark, CA, United States: International Defense Security & Technology. Available online at: https://idstch.com/space/chinas-escalating-space-militarization-assessing-destructive-counter-space-capabilities-and-weapons-advancements (Accessed August 18, 2025).

Vidal, F., and Privalov, R. (2024). Russia in outer space: a shrinking space power in the era of global change. *Space Policy* 69, 101579. doi:10.1016/j.spacepol.2023.101579

Vogler, J. (1995). *The global commons: a regime analysis*. Wiley.

Weeden, B. (2023). Testimony before the U.S.-China economic and security review commission: hearing on China's increasingly global legal reach. *U.S.-China Econ. Secur. Rev. Comm.* Available online at: https://www.uscc.gov/sites/default/files/2023-05/Brian_Weeden_Testimony.pdf (Accessed September 4, 2025).

Williams, M. (2024). Filling the void: why existing international law is not suited to mitigating space debris. *Mich. J. Int. Law*. Available online at: https://www.mjilonline.org/filling-the-void-why-existing-international-law-is-not-suited-to-mitigating-space-debris (Accessed August 21, 2025).

Yang, J. (2017). *Leading the international governance of the new frontier with the idea of 'community of shared future for mankind'* Beijing: People's Daily Online Available online at: http://cpc.people.com.cn/n1/2017/0623/c191095-29358375.html (Accessed September 3, 2025).

Zhang, J. (2019). China home to 140+ commercial space companies. Available online at: https://global.chinadaily.com.cn/a/201905/15/WS5cdbd1f0a3104842260bbcf7.html (Accessed September 3, 2025).