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Geopolitics looks to space



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Abstract:

The accelerated increase in space missions, coupled with the militarization and, more recently, the continuous weaponization of the orbital environment by various international actors, has transformed outer space into an active theatre of operations, eroding the historic consensus established by the 1967 Outer Space Treaty. The constraints imposed by orbital mechanics, the distribution of space infrastructure, and the growing dependence on these capabilities have shaped a new strategic environment in which the assumptions of classical geopolitics are no longer fully applicable. The orbital environment permits neither static occupation nor territorial fixation, as assets in orbit remain in constant motion under the immutable laws of astrodynamics. Consequently, concepts of power projection developed for the terrestrial domain cannot be transferred automatically to the space domain. Therefore, the true Gordian knot of geopolitics as applied to space does not lie in its "conquest," but rather in the ability to control, protect, and ensure the resilience of the satellite constellations and the communications, positioning, and Earth-observation networks upon which modern states depend to coordinate and execute military operations across the land, maritime, air, and cyber domains within the framework of multidomain operations—an analytical perspective that Astropolitics helps to explain.

Keywords:

Astropolitics, outer space, geopolitics, power.

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Introduction

During the Cold War, the race for the 'conquest' of outer space (hereinafter space) generated intense technological, ideological and strategic deterrence competition between the superpowers, and although it might appear that little or nothing has changed since the signing of the Outer Space Treaty (OST)[1] in 1967, the reality is very different.

Over the past decade, space, once reserved for scientific exploration and civil cooperation, has been transformed into a new arena of strategic competition among the great powers, owing to its relentless weaponisation and militarisation. This development, together with the rise of the private sector in this domain and the increasing dependence of communications, defence, security and the economy on space capabilities, has intensified rivalry among the principal international actors, consolidating outer space as a new domain for power projection and active warfare (for the time being, largely imperceptible to society at large). This situation reaffirms the growing relevance of astropolitics[2] as an indispensable analytical framework for understanding how States project power within this environment. What is at stake today is no longer merely a presence in space, but the capability to act in, from and towards it.

Ultimately, space has ceased to be a supporting domain, subordinate to operations conducted across the other domains, and has become, according to United States doctrine, 'a warfighting domain, not a collection of supporting activities', an environment in which 'military operations must be conducted to secure one's own freedom of action and deny it to adversaries'[3].

In this new context, decades of relative strategic equilibrium have been disrupted, jeopardising the security of critical infrastructure, the capability for power projection and the stability of global deterrence, all of which ultimately depend upon control of space, now an essential condition for any multidomain operation.

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[1] United Nations. (1967). Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. Adopted by the General Assembly in Resolution 2222 (XXI) of 19 December 1966.

[2] Dolman, Everett C., *Astropolitik: Classical Geopolitics in the Space Age*, Londres, Frank Cass, 2002, p. 12. Dolman, Everett C., Astropolitik: Classical Geopolitics in the Space Age, London, Frank Cass, 2002, p. 12. The author defines astropolitics as 'the study of the relationship between the outer space environment and technology, and the development of political and military policies and strategies'.

[3] SFDD-1. Space Force Doctrine Document-1. USSF (United States Space Force). 2025.

Accordingly, the question is no longer whether space possesses geopolitical relevance, but rather how geopolitics should be applied when, within this new environment, some of the concepts and principles that have traditionally underpinned it cease to apply.

In this regard, the present study is structured into four sections. First, it examines strategic competition among the principal international actors through a synthesis of their operational and institutional transformations over the past decade. It then considers which elements of the classical geopolitical corpus remain applicable to rivalry for power in, from and towards space. On this basis, it analyses the extent to which astropolitics contributes to an orbital reformulation of these postulates and, finally, concludes by assessing their principal legal, geopolitical and military implications.

Strategic Competition

The following section synthesises the principal operational and institutional transformations undertaken over the past decade by a range of leading actors:

In December 2019, the United States Congress passed the National Defense Authorization Act[4], establishing the United States Space Force (USSF) as an independent sixth military service and creating the United States Space Command (USSPACECOM) as a unified combatant command, separate from the United States Strategic Command (USSTRATCOM). Subsequently, in April 2025, the USSF published its first foundational doctrinal document, SFDD-1[5], in its capacity as an independent Service. Earlier, the Trump Administration had launched the Golden Dome missile defence initiative, based on an architecture that includes permanently orbiting armed interceptors.

At the London Summit (2019), NATO declared outer space to be its ‘fifth operational domain’ (this designation reflects a deterrence-oriented approach, consistent with the Alliance’s strictly defensive nature). Subsequently, at the Brussels Summit (2021), it established that ‘an attack to, from, or within space’ could trigger the invocation of Article 5, although, as in the other domains, this remains subject to a political decision by the North Atlantic Council. The Alliance possesses no organic space capabilities and

[4] S.1790 – National Defense Authorization Act for Fiscal Year 2020. https://www.congress.gov/bill/116th-congress/senate-bill/1790/text . [Accessed: 12/08/2026].
[5] SFDD-1, *op. Cit*.

therefore depends upon those voluntarily provided by its member States and by the commercial sector.

In 2022, the United Kingdom published its Defence Space Strategy, which promotes a dual civil-military approach and organises its capabilities around four pillars: 'space domain awareness, space control, space support to operations, and the launch and sustainment of orbital assets'[6].

Over the past decade, China has consolidated a broad spectrum of civil, military and commercial space capabilities, establishing itself as the world's second leading space power. In 2024, it reorganised the Strategic Support Force (created in 2015), redistributing its responsibilities among three new independent services: the Aerospace Force, the Cyberspace Force and the Information Support Force[7]. Operationally, it has demonstrated advanced capabilities in electronic interference, cyberattacks against foreign orbital infrastructure, directed-energy systems, and sophisticated rendezvous and proximity operations (RPO), exemplified by the SJ-21 satellite. Furthermore, it possesses a direct-ascent anti-satellite (DA-ASAT) capability in low Earth orbit—demonstrated since its 2007 test—and has deployed co-orbital satellites equipped with robotic arms, making it the only actor capable of competing with the United States across the full spectrum of space capabilities.

Russia has prioritised electronic warfare as the cornerstone of its asymmetric doctrine, deploying systems such as Zhitel, Krasukha-4 and Divnomorye-U, alongside offensive cyber capabilities. In 2015, it established the Aerospace Forces of the Russian Federation, integrating the former Air Force with the Aerospace Defence Forces. It also maintains RPO programmes—such as the Luch satellites—and, in 2025, possible tests of orbital weapons technology were detected[8].

India has significantly accelerated its space activity, increasing from a single annual launch to seven launches in 2023, the same year in which it successfully landed a robotic mission on the lunar surface. In March 2019, it conducted its first DA-ASAT test, becoming the fourth country to demonstrate this capability successfully. In 2023, it adopted its first National Space Policy and presented the Space Vision 2047 document, while

[6] IEEE (Spanish Institute for Strategic Studies – CESEDEN), Geopolitics of Space, Strategy Notebooks 235, Ministry of Defence, 2026, pp. 97–98.
[7] Ibid., p. 114.
[8] Ibid., pp. 125-127.

simultaneously strengthening its military component through new indigenous intelligence, surveillance and reconnaissance, as well as positioning, constellations[9].

The European Union Space Programme encompasses Copernicus, Galileo, EGNOS, GOVSATCOM and the Space Situational Awareness (SSA) component. Added to these is IRIS2, the secure connectivity constellation approved in 2023, which operates as a legally distinct programme while remaining part of the Union's broader space strategy. The most significant transformation has been the gradual shift from a purely civilian model towards a dual security and defence approach, driven by the Strategic Compass and the EU Space Strategy for Security and Defence[10].

With its 2019 *Stratégie spatiale de défense*[11], France became the first country explicitly to declare the right to the 'active self-defence' of its own satellites. This approach has been reinforced through its new-generation military satellites (Syracuse-4A and 4B), which provide the French Armed Forces with next-generation encrypted satellite communications.

Spain has undertaken a doctrinal and institutional reconfiguration structured around three milestones: the 2019 National Aerospace Security Strategy, revised in 2025 (although still without a dedicated National Space Strategy)[12]; the transformation of the Air Force into the Air and Space Force in 2022; and the creation of the Spanish Space Agency in 2023, which consolidated the State's previously dispersed competences within a unified civil-military governance framework.

Operationally, Spain relies on the Space Surveillance Operations Centre (COVE), integrated within the Aerospace Command, which provides early warning and space surveillance and tracking (SSA/SST) to protect assets such as SPAINSAT and PAZ, while also contributing data to the EU SST consortium. Furthermore, Spain combines its participation in the Artemis Accords with a firm commitment to European strategic autonomy, while supporting the domestic space industry through programmes such as IRIS2, Galileo and Copernicus.

[9] Ibid., pp. 128-130.
[10] EU Space Strategy for Security and Defence. Available at: https://ec.europa.eu/transparency/documents-register/detail?ref=JOIN(2023)9&lang=es. [Accessed: 29/08/2026].
[11] Ministère des Armées. 2019. Stratégie spatiale de défense. Paris: Ministère des Armées. https://www.vie-publique.fr/files/rapport/pdf/194000642.pdf. [Accessed: 12/08/2026].
[12] Sánchez Delgado, J. C., and De la Torre Valentín, J. A., The Space Domain in the National Aerospace Security Strategy. IEEE. Strategy Notebook 2025. Geopolitics of Space. Chapter 6.

Geopolitics and Territory-Anchored Power

Classical geopolitics, developed during the final decades of the nineteenth century and the early twentieth century, holds that the distribution of international power is profoundly conditioned by physical geography and that strategic primacy depends upon control of the geographical spaces regarded as decisive. From this perspective, territory constitutes the principal foundation of political, economic and military power, such that competition among the great powers is structured around the occupation, domination or denial of access to strategic areas.

Accordingly, Mahan (1890) conceived the effectiveness of maritime hegemony in terms of control over oceanic routes and the principal maritime straits and chokepoints. Subsequently, Mackinder (1904, 1919) formulated the Heartland theory, identifying the interior of Eurasia as the geostrategic core of the international system, encapsulated in his well-known maxim: 'Who rules East Europe commands the Heartland; who rules the Heartland commands the World-Island; who rules the World-Island commands the world.' Later, Spykman (1944) revised this approach by assigning strategic primacy to the Rimland, the Eurasian littoral belt, arguing that control of this maritime periphery was decisive for containing continental power. Finally, Brzezinski (1997) adapted these postulates to the post-Cold War context while preserving the fundamental premise that control of key geographical spaces remains the principal determinant of the international geopolitical balance.

The difficulty in applying the concepts of classical geopolitics to space lies in the fact that it possesses no physical borders and that, pursuant to Article II of the OST, it is subject to the explicit prohibition of national appropriation or sovereign claims.

Moreover, whereas conventional territorial control yields exclusive benefits to the actor exercising it, in space the degradation of the environment generates effects that extend beyond the conflict itself and undermine the security, sustainability and freedom of access of the international community as a whole. Unlike other domains—where only the extreme use of weapons of mass destruction produces consequences on a global scale—in the

orbital environment, ASAT tests or attacks[13], the use of conventional force, or accidents can produce devastating and indiscriminate consequences for all actors[14].

Furthermore, unlike the land, maritime and air domains—where concealment of forces is becoming increasingly difficult but remains possible through terrain or camouflage—space offers no physical cover whatsoever and is subject to continuous surveillance through capabilities that enable Space Situational Awareness (SSA) and Space Domain Awareness (SDA), designed to catalogue and continuously track the majority of orbital objects of significant size. This does not, however, preclude the achievement of strategic surprise through orbital rendezvous and proximity operations (RPO), electronic warfare, cyber operations or dual-use systems, without undertaking detectable physical movements.

Today, the space domain is intrinsically integrated with the land, maritime, air and cyber domains by providing essential capabilities for the conduct of multidomain operations, the protection of critical infrastructure, positioning, navigation and timing (PNT) services, global communications and, in certain contexts, early warning and strategic deterrence. This distinctive character, shaped by the laws of orbital mechanics, the transboundary nature of the domain and the global interdependence of its services, demonstrates that 'space cannot be understood as merely an extension of the air domain'[15], but rather as a distinct strategic domain with its own physical, operational and legal characteristics, albeit one that remains closely interdependent with the other domains, and whose specificity and growing importance define the nature of contemporary astropolitics.

Astropolitics: The Projection of Power without Geography

As argued above, the inadequacy of classical geopolitics for explaining the exercise and projection of power in a domain devoid of territory, borders and physical topography has driven the development of astropolitics as an adaptation to the space environment.

In the aforementioned work *Astropolitik*[16], Dolman transposes the geography and fundamental premises of classical geopolitical thinkers, such as Halford Mackinder and

[13] Moltz, James Clay. 2019. The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests. 3.ª ed. Stanford: Stanford University Press. p. 64.
[14] NATO's Overarching Space Policy, 2019. https://www.nato.int/en/about-us/official-texts-and-resources/official-texts/2019/06/27/natos-overarching-space-policy?utm_source=chatgpt.com. [Accessed: 10/08/2026].
[15] Johnson-Freese, Joan. 2017. Space Warfare in the 21st Century: Arming the Heavens. London: Routledge, p. 2.
[16] Dolman, *op. cit.*

Alfred Thayer Mahan, to the laws of astrodynamics and orbital mechanics that govern space. Thus, the distribution of power is no longer dependent exclusively on territorial control, but becomes conditioned by the relative positioning of space systems, orbital characteristics, the energy costs of transfers, and access to specific gravitational regions.

In this way, Mackinder's *Heartland* equivalent is not a continental landmass, but rather the set of orbital regions close to Earth that concentrate the principal space capabilities, particularly Low Earth Orbit (LEO, between 200 and 2,000 km) and Geostationary Orbit (GEO, at approximately 35,786 km), since control of these regions facilitates dominance over global communications, Earth observation, navigation, and access to resources and routes towards the Moon and deep space.

Just as geographical straits such as Gibraltar, chokepoints in space are regions, orbits, trajectories or gravitational configurations whose accessibility is decisive in conditioning the manoeuvrability and operational effectiveness of other space systems. Consequently, their strategic importance does not lie in their ability to physically block space traffic as a strait does, but rather in their potential to provide advantages in surveillance, positioning, energy-efficient transfers, and area and access denial.

This equivalence between physical geography and the orbital configuration of positions and lines of communication establishes a direct link between astropolitics and naval strategic thought. Accordingly, Klein[17] argues that space power shares with sea power a dependence on lines of communication, logistical nodes and control zones susceptible to interdiction. Just as a naval blockade historically could isolate a State from its maritime trade, the destruction or neutralisation of communications, navigation or reconnaissance satellite constellations could 'blind' a modern military force, depriving it of the command, control and precision capabilities upon which it functionally depends.

To further develop the terminological and conceptual framework employed, it is particularly useful to turn to USSF doctrine (SFDD-1), cited above, which distinguishes 'three orbital regimes for present and future space operations. An orbital regime is a region in space associated with a dominant gravitational system capable of capturing the orbit of other objects. The geocentric regime is the spherical region of space where Earth's gravity predominates, and objects follow orbits and trajectories around it,

[17] Klein, John J. 2006. Space Warfare: Strategy, Principles and Policy. London: Routledge. pp. 45–78.

extending to and beyond geosynchronous Earth orbits (including, among others, transfer orbits and the disposal belt). The cislunar regime is the spherical region extending from geosynchronous orbit to the second Lagrange point of the Earth and Moon, and is characterised by the combined gravitational effects of the Earth and/or Moon. This includes the space between these bodies, orbits and trajectories around the Earth–Moon Lagrange points, and lunar orbits where the Moon's gravity predominates. The heliocentric regime, defined by the gravitational field of the Sun, encompasses the regions of the Solar System that are not primarily under the influence of Earth, the Moon or another Solar System body. […] it also includes the Sun–Earth Lagrange points, as well as their associated orbits and trajectories'[18].

This classification helps to provide a strategic and operational picture of space power, since the geocentric regime currently concentrates the majority of critical infrastructure and essential services for society and the Armed Forces; the cislunar regime has strategic relevance as an intermediate zone towards the Moon and as a platform for surveillance, positioning and deep-space projection; and the heliocentric regime extends astropolitical competition beyond the Earth–Moon system, emerging as a potential domain for the long-term exploitation of resources and logistics within the inner Solar System.

From the conception of space power as a transposition of sea power, John J. Klein[19], in the second edition of the aforementioned book, reorients the approach developed in the first edition, which was closer to the Mahanian tradition and focused on seeking decisive engagement, towards the maritime strategy conception of Sir Julian Corbett[20]. From this perspective, Klein concludes that dominance of space is not an end in itself, but rather a means of ensuring freedom of action, sustaining multidomain operations and supporting political decision-making. On this basis, he proposes three key strategic principles for competition in space:

The first concerns the *Celestial Lines of Communication* (CLOCs), which correspond to Corbett's *Sea Lines of Communication* (SLOCs), and encompass the infrastructure and flows of data, signals and information linking the orbital and terrestrial segments through

[18] SFDD-1, op. cit. p. 20.
[19] Klein, John J. 2025. Space Warfare: Strategy, Principles and Policy. 2.ª ed. London: Routledge.
[20] Corbett, Julian S. 1911. Some Principles of Maritime Strategy. London: Longmans, Green and Co. Disponible en: https://www.gutenberg.org/cache/epub/15076/pg15076-images.html [Accessed: 18/08/2026].

radio-frequency/optical connections. They represent the strategic centre of gravity, meaning that protecting or denying CLOCs is equivalent to controlling maritime routes.

The second principle is the primacy of dispersion. In contrast to the vulnerability inherent in concentrating capabilities in monolithic and costly satellite platforms (*high-value targets*), the author maintains that a distributed, disaggregated and proliferated orbital architecture provides greater operational resilience.

The third principle is the potential primacy of defence, with which he breaks from the traditional assumption that space is an inherently offensive domain in which the attacker always holds the advantage. He argues that a redundant, proliferated and resilient space architecture can reduce the benefits of an attack and favour a defensive posture, such that aggression cannot succeed in paralysing one's own architecture.

With regard to the blockade of CLOCs, Klein distinguishes between near and distant blockades and, within each modality, between the disruption of physical communications and the interference with the electromagnetic spectrum and network communications[21]. In the non-kinetic domain, he highlights blockade through the denial of commercial satellite services, which is fundamental to understanding how space rivalry unfolds below the threshold of physical destruction, thereby avoiding triggering the cascade of debris known as the Kessler syndrome[22].

Furthermore, given the need for States and multinational organisations to adapt rapidly to the new astropolitical environment, Klein argues that policymakers and military leaders must resist the impulse to take a well-balanced organisation and specialise it against a particular type of adversary, in a specific domain, in response to a future scenario that may never materialise. Space power should not be configured solely as an instrument for a hypothetical conflagration in space; rather, it should prioritise infrastructure resilience, operational adaptability and strategic flexibility, ensuring freedom of action and continuity in the face of any type of crisis or adversary[23].

[21] Klein, op. cit., pp. 163-169.
[22] Kessler, D. J., and B. G. Cour-Palais (1978), Collision frequency of artificial satellites: The creation of a debris belt, J. Geophys. Res., 83(A6), pp. 2637–2646, doi:10.1029/JA083iA06p02637.
[23] Klein, *op. cit.*, p. 264.

Conclusions

The growing complexity of geopolitical conflict, together with increasing congestion, competition and rivalry in the space domain, as well as the pronounced dependence of societies and the Armed Forces on essential services such as satellite communications, PNT, early warning, intelligence, and command and control, highlights the significant increase in the vulnerability of the infrastructure, services and strategic capabilities deployed in space.

To address this situation, it would be necessary to promote an international agreement that would make it possible to adapt the OST, which continues to constitute the legal cornerstone of the international space regime, through new legally binding instruments aimed at preserving the sustainability of the orbital environment, ensuring equitable access to orbits and the radio-frequency spectrum, regulating robotic proximity operations, and prohibiting or limiting kinetic ASAT tests in active orbits.

With regard to the existing asymmetry between the United States and its European NATO allies in relation to the institutional transformation undertaken by the former, the level of ambition achieved by the United States constitutes a benchmark that Europe cannot and should not disregard indefinitely if it wishes to avoid a situation of dependence similar to that existing in the field of nuclear capabilities. This scenario requires the European allies to develop their own space capabilities and doctrine, without replicating the US model or promoting an offensive conception of space power, with the aim of consolidating a fundamentally defensive European space posture, underpinned by the resilience of critical infrastructure, space domain awareness, active protection to defend their own orbital assets, and the preservation of freedom of access to and action in space.

Furthermore, the more recent contributions of Dolman and Klein provide a robust analytical framework that integrates classical geopolitics with the particularities of the space environment, while also recognising its inherent limitations. The correspondence between Dolman's spatial structuring and the three regimes identified in SFDD-1—the geocentric, cislunar and heliocentric regimes—demonstrates a notable convergence between academic astropolitics and recent US military doctrine, both articulated around a logic whereby physical, orbital and gravitational characteristics condition access to, operations within and the projection of space power.

As demonstrated throughout this study, space constitutes an operational domain with its own characteristics, risk dynamics and requirements, necessitating a high degree of specialisation and dedicated focus. In order to exploit its particularities and fulfil its enabling function for Joint and Multidomain Operations, it is therefore necessary to possess dedicated capabilities, organisational structures, doctrine, specialised training and conceptual frameworks, all oriented towards preserving freedom of action and access to the orbital environment. In particular, with regard to organisational structure, it appears advisable to establish a clear distinction between the air and space components through clearly differentiated structures, while ensuring that they remain closely coordinated.

The resulting space command should be structured according to an agile, versatile and balanced design, capable of operating across the entire spectrum of confrontation—from strategic competition below the threshold of armed conflict to high-intensity warfare—and conceptually grounded in operational models that guarantee its adaptability and resilience in the face of the rapid transformations of the geostrategic and astropolitical environments.

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