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# Power Transition, Rising China, and the Regime for Outer Space in a US-Hegemonic Space Order

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## Introduction

Reflecting the main concerns of this volume, this chapter focuses on the regime for outer space that is a paradigmatic example of Great Power Management within a hegemonic system. Although it is possible to suggest that a modicum of leadership transition is taking place as a result of China's attempts to assume the role of a 'responsible great power' in space, premised on the provision of global public goods, the international politics of space continues to be defined by the policies and preferences of the United States as the leading space power.

The first section of the chapter offers a very brief history of the Space Age as a background, before examining US-Soviet space relations during the Cold War, in which the emergence of cooperative restraint facilitated the consolidation of the regime for space. The second section considers the principal institutional and normative aspects of the space regime, with a particular focus on the importance of the Outer Space Treaty. The third section examines the current forces that shape the space regime, concentrating on the growing military uses of space, the democratisation of space activities, diplomatic efforts to set norms of responsible behaviour in space, and China's ascendance as a 'space' great power. In lieu of a conclusion, the last part directly addresses the question of whether there is a power transition in space in the context of US-China space relations.

## The Emergence of the Regime for Outer Space

The regime for outer space was very much the upshot of the social interaction between the United States and the Soviet Union underpinned by both competition and cooperation. But

even before Sputnik would herald international society's first steps above the clouds, space was not devoid of cultural meanings, beliefs, and possibilities. Scientific internationalism revolving around solidarist conceptions of science and technology was a key feature of the earlier phase of the Space Age, in which could be observed the interplay between international society and world society as well as the tensions between solidarist and pluralist conceptions of space, both of which have characterised the conduct of space activities ever since. Coexisting often uneasily with a pluralist logic, scientific internationalism was a key driving force behind two turning points that ushered in the expansion of international society in space: the Spaceflight Movement of the 1920s and 1930s and the 1957–1958 International Geophysical Year (IGY) (Stroikos, 2018).

With regard to the former, it was thanks to a diverse amalgam of science fiction writers, space enthusiasts, and amateur engineers, known as the Spaceflight Movement, pushing for the idea of spaceflight that rendered it less fanciful in the 1920s and 1930s. Public fascination with spaceflight was evident in the formation of a number of rocket societies, especially in Soviet Russia and Weimar Germany. While the activities of these amateur societies cannot be understood outside their specific national contexts, it is also evident that by the early 1930s the spaceflight movement had already emerged as a transnational and cosmopolitan network of space enthusiasts driven by the common dream of making spaceflight a reality. Thrown into disarray as a result of the Second World War, transnational contacts were crucially re-established after 1945, leading to the formation of the International Astronautical Federation (IAF) in 1951, which is today the world's leading space advocacy body (Stroikos, 2018).

The other turning point was the 1957–1958 International Geophysical Year (IGY), a major global scientific event that was - at least in part - propelled by the ideals of scientific cosmopolitanism and scientific internationalism. It is important to remember, that the launch of the first artificial satellites occurred as part of the IGY. Certainly, by that time, the IGY was steeped in the logic of the superpower antagonism, but it was also a remarkable reflection of scientific internationalism, not least because it unfolded under the circumstances of the Cold War (Stroikos, 2018).

These observations are salient, especially considering that the story of the international politics of space is usually told along realist lines of power politics and competition among states, typified in the notion of the space race between the superpowers. Undoubtedly, the quest for power and prestige was very important, as was the development of military space-based assets. Yet, as Von Bencke (1997) highlights in the context of discussing the history of US-Soviet space relations, competition coexisted with cooperation from the outset. The

competition between the United States and the Soviet Union and the politics of the space race are sufficiently well-known to need little recapitulation here (Bille and Lishock, 2004; Launius, 2019; McDougal, 1997; Moltz, 2008; Von Bencke, 1997). But a couple of points are worth emphasising. First, it is not possible to understand the origins of the Soviet space programme, without recognising the significance that the possession of long-range delivery systems had assumed because of the exigencies of the confrontation with the United States. This was precipitated by the first Soviet test of a hydrogen bomb in 1953 and the need for possessing intercontinental ballistic missiles (ICBMs) capable of delivering nuclear weapons against the United States. This effort culminated in the development of the R-7 missile in 1957 that allowed for the launch of Sputnik (Sheehan, 2007: 25). Still, we do know now that the trajectory of the early Soviet space programme owed much to the initiatives of chief designers and engineers involved in the missile programme, typified in the role of Sergei Korolev (Siddiqi, 2010).

Second, whatever one thinks about the immediate impact of Sputnik on US space policy and the so-called 'Sputnik Crisis', there is evidence to suggest that President Eisenhower was less preoccupied with the prestige value that could emanate from launching a satellite ahead of the Soviets and more concerned with ensuring that Moscow would not object to the overflight of US military satellites over Soviet national territory, known as the 'Freedom of Space' principle (McDougall, 1997: 121-124). With the benefit of hindsight, it is clear that Eisenhower undervalued the prestige deriving from spaceflight (Launius, 2010: 259-260). However, it is also apparent that the concern with the freedom of space made sense from a strategic point of view, given that the use of reconnaissance satellites would allow the United States to gather much-needed information about the Soviet missile and nuclear programmes that operated under a shroud of secrecy. We may be customed now to the idea of thousands of satellites orbiting Earth, but the principle of free transit of space was not evident at the time (Bille and Lishock, 2004: 74). For the Eisenhower administration, therefore, the launch of Sputnik helped to establish a legal precedent for the freedom of space, especially given that no country opposed the satellite's overflight (Kalic, 2012: 124). Accordingly, this formative period witnessed the establishment of the 'Freedom of Space' principle in practice.

Another important consequence of Sputnik was the 'social construction' of space technology as a principal symbol of scientific and technological leadership, modernity, and power in international society, reflective of the logic of conceptualising technoscientific advancement as a standard of civilisation rooted in the nineteenth century (Stroikos, 2020). This would be further manifested in the several space achievements that ensued as part of the

Moon race, epitomised by human spaceflight. Equally, the launch of the world's first artificial satellite marked the gradual emergence of space as a realm for international politics and legal regulation, effectively extending the primary institutions of international society from Earth to high Earth orbit.

Having said that, the process of consolidating order in space was neither smooth, nor predetermined. Nowhere was this more apparent than in the use of weapons in space. Many assumed the inevitability of conflict in space as the next warfighting domain and both superpowers carried out plans for detonating nuclear weapons in high altitudes and the use of anti-satellite weapons. Crucially, however, as Gallagher (2005) suggests, both the United States and the Soviet Union steadily realised that their security in space was best served by rules and restraint as a way to maintain stable deterrence and promote their political interests in the context of the Cold War. Instead, they opted for great power management strategies that went beyond space law to encompass 'a patchwork of international agreements, principles, national policies, and informal behavioral rules through which all the states with a stake in space tried to balance their common and conflicting interests' (Gallagher, 2005: 3).

In his remarkable book *the Politics of Space Security*, Moltz (2008) argues that the emergence of strategic restraint was one of the most important features displayed in the space relations between the superpowers, especially from 1962 to 1975. He shows how the United States and the Soviet Union came to gradually recognise the increased risks associated with detonating nuclear weapons and conducting anti-satellite (ASAT) tests arising from electromagnetic pulse (ELP) radiation and orbital debris. In other words, this was a process of 'environmental learning' through social interaction. Consequently, rather than jeopardising the significance of space for supporting vital elements of military operations such as surveillance, reconnaissance, and early warning as the basis for nuclear deterrence and strategic stability, the superpowers accepted space as a collective good (Moltz, 2008).

Under such circumstances, the space race acted as a sort of a substitute for war: that is, a rivalry premised on mutual restraint and great power management, based on shared understandings of what responsible behaviour entails in space. The emergence of great power management was facilitated by the improved climate resulting from détente, dramatically illustrated by the Apollo-Soyuz Test Project (ASTP) in July 1975 and the famous handshake in space (Ross-Nazzal, 2010). Even so, order in space remained fragile as tensions and challenges would periodically arise between the United States and the Soviet Union dictated by shifting balances of domestic interests and external factors (see Von Bencke, 1997). But

what suffices here to say is that attempts at managing space and the accompanying expectations about legitimate behaviour were codified in a set of norms, rules, and principles.

**The Institutional and Normative Aspects of the Regime for Space**

Multilateral cooperation has been a principal pillar of institutionalising order in space with the United Nations system at the heart of this effort. Although the superpowers could have opted for setting rules for space bilaterally, they settled on using a multilateral venue for cooperation on pragmatic and normative grounds. At one level, multilateralism was appealing because it would allow for gathering support from the other superpower and third states. At another level, using a multilateral forum would help each superpower to strengthen its leadership credentials in the context of their adversarial relationship by showcasing their commitment to inclusive patterns of cooperation (Peterson, 2005: 23).

Thus, soon after the launch of Sputnik, the United Nations General Assembly created the Committee on the Peaceful Use of Outer Space (COPUOS) in Vienna as an ad hoc committee, which was vital for the development of the legal framework governing space activities, more on which below. In addition to COPUOS, the UN Conference on Disarmament (CD) in Geneva has been the exclusive venue for the negotiation of arms control in space, exemplified by the adaption of the resolution on Prevention of an Arms Race in Outer Space (PAROS) that was placed as item on the agenda of the CD in 1982. Three years later, an *ad hoc* committee was formed tasked with negotiating PAROS until 1994, without yielding results. The Reagan administration was sceptical about the need to negotiate arms control in space on the grounds that such attempts could compromise the Strategic Defence Initiative (SDI) and missile defence projects, something that was shared by the consecutive US administrations (Moltz, 2014: 151-152). In turn, frustration with the resulting stalemate has led to new initiatives outside the purview of COPUOS, as we shall see. Another important organisation related to space activities is the International Telecommunication Union (ITU), responsible for the regulation of the radio frequency spectrum and the allocation of slots available in geostationary orbit.

The space regime is comprised of five international treaties that were all signed during the Cold War. These are: the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, known

as the 'Outer Space Treaty' (OST)[1]; the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the 'Rescue Agreement')[2]; the Convention on International Liability for Damage Caused by Space Objects (the 'Liability Convention')[3]; the Convention on Registration of Objects Launched into Outer Space (the 'Registration Convention')[4]; and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the 'Moon Agreement')[5] (United Nations Office for Outer Space Affairs, 2008).

Alongside these treaties are declarations and principles,[6] and several bilateral disarmament and arms control agreements between the United States and the former Soviet Union[7]. It also consists of multilateral and bilateral legal instruments pertaining to the commercial use of space and a series of pronouncements regarding the formation and function of intergovernmental bodies and organisations with a space component (Tannenwald, 2004: 370).[8]

Significantly, the Outer Space Treaty introduced a set of principles and concepts that outline the parameters of international space law. As such, it is considered to provide the foundations

[1] The Outer Space Treaty was adopted by the General Assembly in its resolution 2222 (XXI) and entered into force in October 1967.
[2] The 'Rescue Agreement' was adopted by the General Assembly in its resolution 2345 (XXII) and entered into force in December 1968.
[3] The 'Liability Convention' was adopted by the UN General Assembly in its resolution 2777 (XXVI) and entered into force in September 1972.
[4] The 'Registration Convention' was adopted by the UN General Assembly in its resolution 3235 (XXIX) and entered into force in September 1976.
[5] The 'Moon Treaty' was adopted by the UN General Assembly in its resolution 34/68 and entered into force in July 1984.
[6] These are: the Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space (UN General Assembly resolution 1962 (XVIII) of December 1963); The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (UN General Assembly resolution 37/92 of December 1982); The Principles Relating to Remote Sensing of the Earth from Outer Space (UN General Assembly resolution 41/65 of December 1986); The Principles Relevant to the Use of Nuclear Power Sources in Outer Space (UN General Assembly resolution 47/68 of December 1992); The Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (UN General Assembly resolution 51/122 of December 1996). See, United Nations Office for Outer Space Affairs (2008).
[7] More specifically, the 1963 'Partial Test Ban Treaty' (PTBT), also abbreviated as the 'Limited Test Ban Treaty' (LTBT), formally the 'Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water', prohibits the use of nuclear weapons in space, ratified by the Soviet Union, the United Kingdom, and the United States. In addition, the Interim Agreement between the United States of America and the Union of Soviet Socialist Republics on Certain Measures with Respect to the Limitation of Strategic Offensive Arms (SALT I), prohibits interference with National Technical Means (NTM) of verification (reconnaissance and communications satellites). The SALT II agreement also includes provisions relating to outer space by forbidding the placement of weapons of mass destruction in space. The 1972 Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems (ABM Treaty), recognised the non-interference principle by one party with the national technical means of verification of the other and prohibited the deployment of space-based missile defence systems between the two parties. But in December 2001, the Bush administration announced the US withdrawal from the ABM Treaty. For a good overview of these developments and the treaties concerning arms control, see Graham and LaVera (2003).

of the legal framework governing space activities. Specifically, the Outer Space Treaty acknowledges 'the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes' and that 'the exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind'. It also stipulates that 'outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means' and prohibits the placement of nuclear weapons or other weapons of mass destruction in orbit or on other celestial bodies. In short, the rudimentary principles governing space activities include the postulations that space should be reserved for 'the benefits and in the interests of all mankind' and for 'peaceful purposes' and that it is 'nonappropriable' (Tannenwald, 2004: 370-371).

To be sure, one of key rationales for the Outer Space Treaty was to prevent outer space from turning into a theatre of colonial competition and military conflict (Park, 2006: 877). Yet, what the exact application of these principles means remains debatable today in the face of emerging challenges, including the weaponization of space, the privatisation of space activities, and plans for the exploitation of natural resources of the moon and other celestial bodies. A discussion of these issues is beyond the scope of this chapter, but a few points are worth making. First, in many ways, the Outer Space Treaty can be seen to mark a shift from a Westphalian to a cosmopolitan conception of sovereignty (Stuart, 2009: 16). This is reflected in the principles of 'Mankind', and 'non-appropriation' and the stipulations that space should be used 'for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development'. At the same time, however, the Outer Space Treaty confers the responsibility of space activities upon states, regardless of 'whether such activities are carried on by governmental agencies or by non-governmental entities' (Fawcett, 1984: 10). These normative tensions reflect the order/justice dilemma highlighted by English School scholars, exacerbated now by the growing privatisation and commercialisation of space.

Related to the issue of justice is accessing space technology in the developing world. As Wolter (2006:96) points out, an important principle encapsulated in the Outer Space Treaty is that of state equality expressed in the clause 'in the interest of all countries irrespective of the degree of economic or scientific development', indicating the duty of great powers to assist the involvement of developing countries in space activities. Concerns of justice and development were evinced in the Global South's early calls for a New World Information and Communication order in the 1970s and the allocation of orbital slots and frequencies on the

basis of 'the first-come, first served' policy of the ITU. Some of these concerns were addressed in 1982 when the ITU reworded its Convention by 'taking into account the special needs of the developing countries and the geographical situation of the developing countries'. The 1982 UN Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82) also acknowledged the importance of facilitating the access of space technology in the developing world through cooperative means.[8]

As far as the militarisation of space is concerned, there are different interpretations of the term 'peaceful uses', but, generally, there is agreement that 'peaceful' refers to 'non-aggressive' rather than 'non-military' (Kuskuvelis, 1988: 91-92). Equally, while the legal framework for space prohibits the placement of nuclear weapons and other weapons of mass destruction in space, it does not rule out the transit of nuclear weapons through space, the use of conventional weapons or the use of anti-satellite (ASAT) weapons or the launch of nuclear weapons from Earth into space targeting an incoming missile (Tannenwald, 2004: 371). Further complicating things is the distinction between the 'militarisation' and 'weaponisation' of space. There is an abundant literature on this issue, reflecting opposing national interests among space powers. On the one hand, a space weapon is considered 'any specialized destructive device built to operate or take effect' from Earth-to-space, space-to-space, and space-to-Earth (Bulkeley and Spinardi, 1986: 3, 4). But others restrict the term to those devices placed in orbit that can attack targets in space or on Earth (Institute of Air and Space Law, 2005: 3).

In sum, it is possible to say that the regime for space underwent an astonishing development in little more than few decades, notwithstanding its significant flaws and limitations. This was largely due to the balance of power between the superpowers together with the shared understanding that space was more important for preserving strategic stability and producing benefits from space-based military and civilian applications rather than as a battlefield. Thus, the balance of power provided the basis for the working of other institutions, such as great power management, diplomacy, and international law. At the same time, throughout this period, space power was largely understood in terms of military and civil uses based on national, centralised management through strong bureaucracies and state-funded R & D (McDougal, 1997).

[8] A useful overview of the perennial themes of development and justice in space on which this discussion builds is provided in Sheehan (2007: 124-141).

**Militarisation, Democratisation, Complex Governance, and the China Challenge: Space Order in Flux**

One of the immediate consequences of the end of the Cold War was the consolidation of the hegemonic position of the United States in space, accompanied by the unravelling of the great power management that guided much of US-Soviet space relations and the workings of the space regime. Initially, space security issues lost their urgency with Washington being more concerned about the possible chaotic collapse of the Soviet Union and its impact on the proliferation of missile and space know-how. Consequently, space cooperation became the dominant theme undergirding the international politics of space, with the International Space Station as the pre-eminent exemplar. This emphasis on cooperation encompassed fostering commercial ventures, testifying to the growing role of the commercial space sector. What is more, confirming the US status as the space hegemon, the US made available to all the Global Positioning System (GPS) as a global public good along with sharing space situational awareness capabilities.[9]

However, since the early 2000s, four interrelated, and often competing themes have come to affect the space regime: the trend towards the increasing military use of space; the commercialisation and democratisation of space activities; new initiatives pertaining to space security; and China's rise as a 'space great power'.

*The Growing Militarisation of Space*

By the early 1990s, military space systems were assuming increasing importance as a force multiplier that augments the efficacy of combat forces. This was evident in the gradual shift from the use of space-based assets for strategic deterrence to their use at the tactical level that was first demonstrated during the first Gulf War in 1991, also known as the 'first space war'.[10] The concepts of space support, force enhancement, space control and force application developed alongside the recognition that 'access to and use of space' is 'a vital interest' of the United States, articulated in the national space policy of the Clinton administration. Yet, under Clinton, no tangible steps were taken towards carrying out this policy (Moltz, 2008: 239-240, 254; Sheehan, 2007: 94, 98). But the US space policy changed dramatically when the George

[9] On US-Russia space relations of this period, see especially Moltz (2008: 228-256).
[10] On space as a military force multiplier, see Sheehan (2007: 91-108). Also, see Handberg (2000) and Wong and Fergusson (2010).

W. Bush administration announced plans for the deployment of space-based missile defence systems and the development of ASAT weapons, indicating a policy directed towards the weaponization of space.[11] This coincided with US doctrines and documents that highlighted the need for space weapons and control in space. Characteristic of this trend was the influential *Report of the Commission to Assess United States National Security Space Management and Organization,* which was the product of the 'Space Commission' chaired by Donald Rumsfeld before taking over as US defence secretary. The report famously forewarned of an imminent 'space Pearl Harbour' and called for ensuring the continuing space superiority of the United States (Commission to Assess United States National Security Space Management and Organization, 2001: viii, x).

This was followed by the decision of the Bush administration to withdraw from the Anti-Ballistic Missile Treaty (ABMT) that had served as a cornerstone of strategic stability, paving the way for space-based missile defences. Soon afterwards, a series of US military documents introduced the concept of space superiority and the 2006 new national space policy stressed, among other things, the US opposition to 'new legal regimes or other restrictions that seek to prohibit or limit U.S. access to or use of space' as well as the goal of developing 'capabilities, plans, and options to ensure freedom of action in space, and if, directed, deny such freedom of actions to adversaries' (The White House, 2006: 2, 4). Simply put, the combination of unilateralism and a sense of exceptionalism associated with neoconservatism that was so typical of the Bush era was now projected in space.[12]

For some observers, this sort of wording in US space policy documents placing emphasis on space superiority while leaving the option open for weaponizing space had the effect of convincing other countries about the inevitability of space weaponization, amplifying the security dilemma in space (Peoples, 2008). In any case, security dilemmas in space are complicated because of the inherent dual-use nature of space technology that blurs the distinction between offensive and defensive space weapons (Johnson-Freese, 2007). China's 2007 ASAT test, followed by India's ASAT test in 2019 and Russia's ASAT test in 2021 serve to further illustrate the potential volatility of the space regime and the weakening of order in space. Today, evidence abounds that an increasing number of states, including all major space

[11] For detailed accounts of the US space policy under the George W. Bush administration, inter alia, see Moltz (2008: 259-301); and Johnson-Freese (2009: 56-94).

[12] Some of these neoconservative themes were highlighted in Dolman's (2002) influential book *Astropolitik* that applied classical geopolitics to outer space calling for the establishment of US hegemony in space to serve as the guardian for the space activities of all states through advancing capitalism and liberal democracy.

powers (United States, China, Russia, Europe, Japan, India) have been investing in the militarisation of their space programmes, fuelling uncertainty and mistrust.[13]

*Commercialisation and Democratisation*

Apart from the growing interest in the military uses of space, two other aspects of the international politics of space that shape the current dynamics of the space regime are the commercialisation of space activities and the participation of new actors, both of which have rendered the governance of space more complex. In this respect, the first point to make is that the domain of space is not only more internationalised and commercialised than ever, but the global economy has become more dependent on space-based assets. According to a recent report, it is estimated that the global space economy grew by 4.4 per cent over 2019, reaching 447 billion dollars in 2020, with commercial activities representing roughly 80 per cent of the total space economy (Space Foundation, 2021). Tellingly enough, there are now more than 4,000 satellites operating in orbit, with more than 80 countries having a registered satellite in orbit (Union of Concerned Scientists, 2021; OECD, 2019). This points to the 'democratisation' of space activities in the sense that the number of actors in space, from private entities to developing countries, has increased significantly with a wide range of new actors having a stake in the space regime (Baiocchi and Welser IV, 2015). Indeed, attention is usually paid to new private actors such as SpaceX and Blue Origin, but developing countries are increasingly interested in space utilisation, especially for socio-economic development (Harding, 2013).

For some analysts, the privatisation and commercialisation of space in tandem with the dependence of the global economy on space creates a sort of liberal interdependence that may overcome the weaponization of space (Whitman Cobb, 2021). Whatever one thinks of such claims, as far as the space regime is concerned, it is reasonable to expect that the space industry will play a significant role in establishing a self-regulatory framework for the sustainable commercialisation of space (Chrysaki, 2020).

Related to the previous point, as Newlove-Eriksson and Eriksson (2013) suggest, one of the most noteworthy features of the global governance of space is the shift from state to private authority as well as the spread of transnational Public–Private Partnerships (PPPs). Not only does this blur the lines between the military and civil uses of space, but it also obfuscates the

[13] This trend is evident in the development of counterspace capabilities by key space powers. See, for example, Harrison et al (2021) and Weeden and Samson (2021).

distinction between private and public activities. Among other effects, the growing role of translational private authority in space security poses challenges about accountability and responsibility. As we shall see, the commercialisation and democratisation of space will have some important implications for the idea of power transition, but the general observation that flows from this discussion is the emergence of space as a mixed-actor environment, characterised by the diffusion of power in the global governance of space activities.

*Multilateral Initiatives*

Given that the notion of power politics and competition seems to dominate public discourse, one might be forgiven for thinking that multilateral cooperation is not as important as it used to be (Cross, 2019). Yet, the reality is that in recent years there have been significant diplomatic initiatives and proposals designed to address salient aspects of space security at a time when orbits are becoming crowded.

In 2008, China and Russia submitted to the Conference on Disarmament (CD) a draft for a legally binding 'Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects' (PPWT) (Loshchinin and Wang, 2008). The proposal was driven by Chinese and Russian concerns that the US ballistic missile programme could potentially compromise their nuclear deterrents (Arbatov, 2010: 85). As an attempt to break the impasse in the negotiations for arms control in space, it was welcomed. However, the draft focused on prohibiting the use of space-based ASAT and BMD systems and space-to-Earth weapons, but did not rule out the research, testing or deployment of ground-based space weapons, such as the one that China had tested in 2007. In addition, the draft did not include a provision for a verification regime. As a result, the draft did not elicit support from the United States and others. In June 2014, China and Russia issued their own updated draft PPWT, which retained the most controversial provisions of the previous proposal, limiting any prospects for positive reaction. (Tronchetti and Liu, 2015: 44-45; Arbatov, 2010: 83-86).

At the same time, despite the opposition of several countries at the CD to the development of space weapons over the years, there was a growing recognition of the need to move beyond efforts to define what is a space weapon and the associated issue of verification, both of which

proved very difficult to resolve at the CD.[14] This signified a normative shift towards non-legally binding frameworks based on voluntary measures. One such alternative proposal was the 2008 EU Code of Conduct for Outer Space Activities with the main goal of setting norms of behaviour that define responsible and irresponsible practices in space by strengthening the safety, security, and sustainability of space activities along with a set of measures on space debris mitigation (Council of the European Union, 2008). The code of conduct generated enough interest to produce a series of multilateral consultations and the issuing of revised drafts, the last in 2014.

Other voluntary initiatives have been more successful, however. In 2007, COPUOS adopted the 'Space Debris Mitigation Guidelines', which were wrought by the international Inter-Agency Debris Coordination Committee (IADC) (United Nations Office for Outer Space Affairs, 2010). Subsequently, in 2013 the UNGA adopted the recommendations of the final report of the Group of Government Experts (GGE) on Transparency and Confidence-building Measures (TCBMs) in Outer Space aimed at promoting mutual trust and understanding among countries and reducing the risk of misconceptions, misperceptions, and conflict (United Nations General Assembly, 2013: 16-18). More recently, in June 2019, after years of negotiations, the Committee on the Peaceful Use of Outer Space (COPUOS) adopted the Guidelines for the Long-term Sustainability of Outer Space Activities that contain a set of 21 voluntary best practices for promoting space sustainability agreed by 92 states (United Nations General Assembly, 2019).[15] Also, in December 2020 the UNGA adopted resolution 75/36 on 'Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviors', proposed by the UK, aimed at developing a set of norms, rules, and principles of responsible behaviour in space (United Nations General Assembly, 2020). Several countries have already submitted their views (Report of the Secretary-General, 2021). These initiatives not only illustrate the importance of space as social domain, but they indicate that many of the traditional normative goals of the space regime are still in place.

[14] For a good overview of the multilateral negotiations to prevent an arms race in outer space, see Wolter, (2006: 55-81). For a detailed discussion of the reasons that have marked a shift towards non-legally binding measures, see Silverstein et al. (2020).

[15] For an insightful discussion of the importance of the guidelines, see Martinez (2021).

*China's Rise as a 'Space Great Power'*

In the early 2000s, facilitated by its phenomenal economic growth, China began to accomplish a series of remarkable feats in space commensurate with the status of a great power, emblematic of which was the launch of *Shenzhou 5* carrying on board China's first astronaut, Yang Liwei. Since then, the list of China's successful milestones in space includes other human spaceflight missions; its first space laboratory module--*Tiangong 1*, in 2011; the landing *of Chang'e-4* spacecraft on the far side of the Moon in 2019; the *Chang'e-5* mission that brought back to Earth samples from the lunar surface in 2020; the launch of its first robotic spacecraft to Mars, *Tianwen-1*, in 2021; and the launch of the core module, *Tianhe*, as part of building the *Tiangong* orbital space station in 2021.[16]

The pursuit of these high-visibility space projects can be explained in large part by their value as signifiers of power, status, and modernity, engrained in a powerful Chinese techno-nationalist conception of science and technology that can be traced back to the idea of techno-scientific advancement as a standard of civilisation, and its role in the expansion of the European international society in the nineteenth century (Stroikos, 2020). In this way, these projects can be seen as part of China's effort to acquire the status of a great power in space (Cunningham, 2009), but they also serve as useful tools aimed at boosting the legitimacy of the Chinese Communist Party (Sheehan, 2013). In any case, the notion of a power transition in space has been largely related to these Chinese achievements in what are noteworthy as *civilian space activities* at a time when the United States has been comparatively less active in high-visible space projects, especially human spaceflight.

Beyond high-visible space achievements, the notion of China as a major space power owes much to the possession of across-the-board space technologies with a wide range of applications for socio-economic and military purposes. In this regard, China has stepped up satellite development, exemplified in the recent completion of the Beidou navigation satellite system, China's version of GPS, while it continues to utilise several communication and remote sensing satellites. To support its vigorous space programme, China has also been keen in constructing new powerful launch vehicles, part of the Long March rocket family. Meanwhile, important progress has been made towards the commercialisation of China's space programme,

[16] For useful recent overviews of China's space programme on which this section builds, inter alia, see Aliberti (2015); Harvey (2019); Hilborne (2021); and Pollpeter et al. (2020).

but it is early to reach conclusions about whether this process will yield results (Pollpeter et al. (2020).

Likewise, over the last decades, China has increased its interest in the military uses of space, expressed in the development of a range of space-based command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities. According to some reports, China is also interested in acquiring an array of technologies that can potentially support destructive and non-destructive counterspace capabilities, including direct-ascent, co-orbital, electronic warfare, and directed energy weapons capabilities (Harrison et al., 2021; Weeden and Samson, 2021). Alongside this, there has been the introduction of doctrinal and organisational changes, particularly under Xi Jinping. For example, China's 2019 defence white paper described the safeguard of 'China's security interests in outer space' as one of its 'national defense aims' and that "[o]uter space is a critical domain in international strategic competition" (State Council of the People's Republic of China, 2019).

It is not surprising that the militarisation of China's space programme has triggered a debate concerning China's intentions and the challenges it poses to US hegemony in space. This was especially the case after China's 2007 ASAT test, when the People's Liberation Army (PLA) shot down a defunct Chinese weather satellite, making China only the third country to demonstrate such an ASAT capability, after the United States and the Soviet Union. In addition to its strategic value, the test was striking not only because the Chinese Ministry of Foreign Affairs seemed to be unaware of its conduct (raising concerns that this was a case of 'fragmented authoritarianism'), but also because it inspired fierce international criticism due to the amount of space debris that was generated, posing a threat to foreign space-based assets. Significantly, in respect of its credentials as a 'responsible great power', China's following ASAT tests were carried out in more 'responsible' ways by not creating space debris and framing them as 'missile defence tests', taking its cues from the Operation Burnt Frost that was conducted by the United States in 2008, indicating a process of social learning (Mulvenon, 2010; Johnson-Freese, 2013).

Nevertheless, with the exception of its 2007 ASAT test and the more recent uncontrolled re-entry of remains of a Chinese rocket from space that drew criticism from US officials as 'irresponsible behaviour' (Nelson, 2021), China's overall behaviour does not suggest a discontent with international norms underpinning the space regime (Freeman, 2019). On the contrary, China has tried to play a constructive role in the global governance of space activities, and this has been generally welcomed by the international space community. For example, China contributed to the 2007 Space Debris Mitigation Guidelines. It was also a key participant

in the Working Group on the Long-term Sustainability of Outer Space Activities and the Group of Governmental Experts (GGE) on Transparency and Confidence-building Measures in Outer Space Activities (TCBMs), discussed previously. Further, the China Manned Space Agency (CMSA) initiated with the United Nations Office for Outer Space Affairs (UNOOSA) the 'United Nations/China Cooperation on the Utilization of the China Space Station' programme under the framework of the UNOOSA's Access to Space for All Initiative, which is aimed at offering opportunities particularly from developing countries to build capabilities in space science and technology on board China's space station.[17] The above are in line with China's broader preference for the UN as the venue for showing its 'responsible Great Power' status and the provision of global public goods (Foot, 2014). China's leadership credentials are also evident in the establishment of the Asia-Pacific Space Cooperation Organization (APSCO) that began officially operating in 2008 with the goal of promoting multilateral cooperation in space science and technology.[18] But does China's proactive space behaviour mark a power transition in the space regime? In lieu of conclusions, we now turn to address this question.

**In lieu of a Conclusion: Is there a power transition in space?**

Despite China's ascendance as a space great power, by and large, we still live in a US-hegemonic space order, and many recent developments illustrate the ways in which international order in space is still defined by the policies and preferences of the United States. A few points are worth making here. First, throughout the brief history of the Space Age, US space policies have contributed to the stability, evolution, and legitimacy of the space regime. There were periods when certain policies and attitudes weakened this order, but they have not undermined it, as we have seen. Second, by any material measure, the United States remains the undisputed leader in space, especially in military terms, manifested in the fact that the United States operates by far the largest number of satellites. To be sure, China's remarkable high-visible space feats have given rise to the notion of China as a space great power that challenges US leadership at a time when the United States has been preoccupied with other

[17] More information on the initiative can be found on UNOOSA's site: https://www.unoosa.org/oosa/en/ourwork/psa/hsti/chinaspacestation/ao_main.html

[18] Headquartered in Beijing, APSCO consists of eight member states: China, Bangladesh, Iran, Mongolia, Pakistan, Peru, Thailand, and Turkey. On the aims and achievement of the organisation so far, see: http://www.apsco.int.

priorities. But impressive as such Chinese accomplishments might be, most of them were achieved by the Soviet Union and the United States several decades ago.

Third, for all the debates about China's challenge to US power, less attention is usually paid to the *multidimensional* nature of US space hegemony that encompasses both material and ideational components. As English School scholars have insisted, it is one thing if you want to be a great power, and it is another to be accepted as such by the other great powers of international society. Put differently, power is social, and space power is not an exception. In this regard, undoubtedly, China has been attentive to the 'rulebook' of the space community of states, especially in terms of acquiring great power status and prestige, and this is already paying off. However, great power status in space cannot be isolated from broader perceptions of a state's behaviour embedded in global international society. This is an important consideration, at a time when certain aspects of China's foreign policy have backfired in Asia, Europe, and elsewhere.

Moreover, space power is multifaceted. As Moltz (2019) argues, the dynamics of twenty-first-century space power are changing. Unlike the Cold War, when space power was determined by state-funded and largely military led space programmes, today the nature of space power is multifaceted and net-centric, premised on the increasing role of the commercial sector and military space alliances. Whereas China's space power largely reflects the state-centric Cold War model, as Moltz suggests, the US space power benefits from a vibrant commercial sector that favours bottom-up innovation and cooperation through its network of space-faring allies, typified in the area of space situational awareness. This networked space power means that the United States maintains its comparative advantage over China and Russia as the world's leading power in space. Interestingly, the extent to which US allies have embraced the US-led Artemis Accords seems to confirm this.

In light of the above, it is possible to argue that there is a modicum of transition regarding the regime of space, but this is more in terms of leadership, rather than power, as a consequence of recent US and Chinese space policies.[19] But although China is playing a greater role in shaping international order in space, it is nowhere close to replacing US space hegemony. After all, there is nothing preordained about a power or leadership transition in space. Nor is this a mechanistic process. In contrast, such as transition will very much depend on how the United States and China will decide to manage space as a common good in the next years and the

[19] On leadership transition, see He and Feng (2019).

extent to which the ever-increasing space community will continue to accept US hegemony and China's bid for great power status.

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