The Laws of War in Outer Space

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Abstract

With the development of technology accelerating at a rapid pace, there has not been a more crucial time to analyze the international legal framework of outer space. The use of outer space for armed conflict is now a reality for space-faring nations and, as such, attention needs to be placed on the legal implications of this modern (potential) theatre of warfare. The applicability of international law to outer space was confirmed in the United Nations Outer Space Treaty that applies to the use and exploration of outer space. With new technologies such as dual-use satellites emerging, complex international law issues relating to the use of force and understanding how and to what extent the international law principles of *jus in bello* – international humanitarian law – apply to the regulation of these outer

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space activities. This chapter examines the evolution of outer space technology and the relevant legal frameworks that exist, and looks at certain aspects of the *jus in bello* principles that relate to the use of outer space. Some legal principles that exist in international humanitarian law may apply to activities in outer space; however, it remains unclear whether these principles are specific enough to take into account the increasingly diverse ways in which outer space could be utilized during the course of armed conflict. Consequently, there is a growing need for clarity in this evolving field of law, particularly as it relates to armed conflict in outer space.

Introduction

It is now more than 60 years since humankind began its "adventures" in outer space. On 4 October 1957, a Soviet space object, Sputnik I, was launched and subsequently orbited the Earth. The launch of Sputnik I heralded the dawn of the space age, the beginning of the space race (initially between the USSR and the United States), and the legal regulation of the use and exploration of outer space. Since then, laws regulating outer space technology have developed which significantly improve the standard of living for all humanity, through, for example, the facilitation of public services such as satellite telecommunications, global positioning systems, remote sensing technology for weather forecasting and disaster management, and television broadcast from satellites. Outer space offers the opportunity for immense social, economic, and scientific growth; however, new challenges are being posed to humanity through this advancement, and law will continue to play a crucial role in this regard.

The commencement of the space age began at the height of the Cold War, when both the United States and the USSR strove to flex their respective technological "muscles." At the time, the two leading space superpowers raced to develop their space capabilities, generating tension on a global scale. In October 1962, shortly after the launch of Sputnik I, the "Cuban Missile Crisis" threatened global security. This security-sensitive environment resulted in the international community's first endeavors to regulate this new frontier of outer space. While the purpose was to reduce the build up of weapons in space, the conventional obligations and restrictions that were agreed upon and codified in the major space treaties were neither entirely clear nor sufficiently comprehensive to meet all of these challenges. While a large body of space scholars would interpret the relevant provisions as prohibiting military space activities in outer space, those who had the capability to use space technology did not follow these restrictions. Since that time, it is clear that space has been utilized for military activities almost from the time of the very infancy of space activities.

Since the commencement of outer space activities, the environment has become significantly more complex and the consequences have heightened. Through the use of remote satellite technology and communication technology, information is being gathered and constantly relied upon by all aspects of society. This information is also

an element in direct terrestrial military activity and represents an integral part of the major superpowers' respective military hardware. With outer space being increasingly used as part of active engagement in the conduct of armed conflict, it is now within the bounds of possibility to imagine outer space as an emerging theatre of warfare (Ricks 2001).

With the development of these outer space capabilities in mind, this chapter focuses on the potential application of the current laws of war to the use of outer space. While the last 60 years has shown us that outer space is being utilized for military purposes, it is not clear how these activities are treated and regulated at the international level. Through applying an analysis of the existing *jus in bello* principles to the domain of outer space, it would seem that the current capability of space-related technology exists outside the established international framework that has regulated the laws of war to date. The unique environment that outer space poses leaves some instances in which the established *jus in bello* principles application are not suitable as a regulatory system for the distinctive domain that is outer space.

Accordingly, this chapter will briefly outline the fundamental principles governing the international legal regulation of outer space and focus more specifically on those that are most relevant to military and warfare-related activities that utilize space technology. Subsequently, it examines the general principles that govern the laws of war in brief, before discussing these principles' relevance to outer space. Following on from this, a number of initiatives designed to (potentially) fill some of the lacunae that appear to exist within the current legal regime will be outlined, before we make some more general observations regarding the way forward in terms of legal regulation.

Ultimately, notwithstanding that the laws of war do theoretically apply to activities in outer space, the principles may not be specific enough to provide appropriate regulation for the increasingly diverse ways in which outer space could be used during the course of armed conflict. With the world's growing dependence on space technology and the ever-increasing space race among the major super powers, it is more important than ever to examine the existing international principles and reach a consensus on additional legal regulation directly applicable to the conduct of armed conflict in outer space. This will require close cooperation and greater trust between the major space powers, supported by other States and the international community. If this framework can be established, it may provide more certainty among the leading space-faring nations and could reduce the risk of the negative repercussions that are associated with space assets and activities.

General Principles of Space Law

The launch of Sputnik I immediately gave rise to difficult and controversial legal questions, involving previously undetermined concepts. Early academia contemplated the nature and scope of laws that might apply to the exploration and use of outer space, but only at a hypothetical level (Lyall and Larsen 2009). The world has since moved on from mere contemplation and has entered a new age of space

technology and reliance. Humanity's ability to adapt and aspire to greater heights has led to the explosion of scientific exploration, the commercialization, and the militarization of outer space. With this rapid change came the international community's need to react to an unprecedented event of an unregulated legal environment.

These changes in space activities were largely driven at the time by the geopolitical situation – predominantly the state of Cold War that prevailed between the United States and the USSR. Time has shown us that the desire for ever-increasing technological prowess was as much motivated by military aspirations as a wish to explore and use space for other (scientific) purposes. It was in this conflicting environment that the international community had to respond. Between the desire of the two superpowers and the greater concerns among the international community, regulation had to somehow strike a balance between contrasting interests.

Accordingly, soon after the launch of Sputnik I, the United Nations established a new committee to take primary responsibility for the development and codification of the fundamental rules relating to the use and exploration of outer space with the name of United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). An ad hoc Committee on the Peaceful Uses of Outer Space, with 18 initial Member States, was established in 1958 by the United Nations General Assembly (UNGA 1958), which subsequently converted it into a permanent body in 1959 (UNGA 1959). UNCOPUOS is now the principal multilateral body involved in the development of international space law. In addition to States, a number of international organizations, including both intergovernmental and nongovernmental organizations, have observer status with UNCOPUOS.

The first question that was posed to UNCOPUOS sought a clarification as to the legal categorization of outer space for the purposes of international law. In order to be in a position to do this, a legal definition of what constituted outer space and where it began was required. While many theories have been put forward since the question was first posed, where air space "ends" and outer space "begins" has thus far remained unanswered from an international legal viewpoint.

Notwithstanding the lack of a clear definition of outer space, a number of fundamental legal principles relating to the exploration and use of outer space quickly emerged – in particular the so-called "common interest," "freedom," and "non-appropriation" principles. These principles were later incorporated into the terms of the United Nations Space Law Treaties, for example Articles I and II of 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, with the result that they also constitute binding conventional rules codifying what had already amounted to principles of customary international law. In essence, the international community, including both of the major space-faring States of the time, had accepted that outer space was to be regarded as being similar to a *res communis omnium* (Cassese 2005).

The aforementioned three fundamental rules that underpin the international law of outer space represent a significant departure from the legal rules relating to air space, which is categorized as constituting part of the "territory" of the underlying State. The principal air law treaties reflect the territorial nature of air space.

For example, reaffirming the principle already acknowledged as early as 1919 (ICAN 1919), the 1944 Convention on International Civil Aviation (ICAO 1944) provides that "every State has complete and exclusive sovereignty over the air space above its territory" (ICAO 1944). Even though, a demarcation between air space and outer space has not yet definitively emerged – at least thus far – this has not in practice led to any significant confusion as to "which law" might apply in particular circumstances (Freeland 2010b). However, as the range of activities in outer space becomes ever broader, the issue will become more important in relation not only to the broad principles of international space law but also on a practical level – for example, to the regulation of commercial suborbital space tourism activities, which, at least under current technological constraints, involve paying passengers being taken to an altitude slightly in excess of 100 km above the Earth (Freeland 2010b).

By contrast, Article II of the Outer Space Treaty encompasses the so-called "non-appropriation" principle, which is regarded as one of the most fundamental rules regulating the exploration and use of outer space (Freeland and Jakhu 2010). The provision reads:

> Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

In essence, Article II confirms that outer space (which includes the Moon and other celestial bodies) is not subject to ownership rights and prohibits inter alia any sovereign or territorial claims to outer space. Outer space therefore is not to be regarded as "territorial," a principle that, by the time the treaty was concluded in 1967, was already well accepted in practice. This was evidenced by the fact that although the USSR had not sought the permission of other States to undertake the Sputnik mission, there were no significant protests that this artificial satellite had infringed on any country's sovereignty as it circled the Earth. As was observed by Judge Manfred Lachs of the International Court of Justice (Lachs 1969):

> [t]he first instruments that men sent into outer space traversed the air space of States and circled above them in outer space, yet the launching States sought no permission, nor did the other States protest. This is how the freedom of movement into outer space, and in it, came to be established and recognised as law within a remarkably short period of time.

By the time that the Outer Space Treaty was finalized, both the United States and the USSR had already been engaged in an extensive range of space activities. However, neither had made a claim to sovereignty over any part of outer space, including celestial bodies, notwithstanding the planting by the Apollo 11 astronauts of an American flag on the surface of the Moon. This is to be compared with the situation in Antarctica, which had seen a series of sovereign claims by several States in the period leading up to the finalization in 1959 of the Antarctic Treaty, 402 U.N. T.S. 71. Article IV of the Antarctic Treaty has the effect of suspending all claims to territorial sovereignty in Antarctica for the duration of that instrument, as well as prohibiting any "new claim, or enlargement of an existing claim." The Protocol on

Environmental Protection to the Antarctic Treaty, 30 I.L.M. 1455, which came into force in 1998, augments the Antarctic Treaty by protecting Antarctica from commercial mining for a period of 50 years. As a result, although it was of great importance to formalize this principle of non-appropriation of outer space, the drafting process leading to the finalization of Article II of the Outer Space Treaty was relatively uncontroversial, particularly given its early acceptance as a fundamental concept by these two space faring States.

It is no coincidence that the non-appropriation principle is set out immediately following Article I of the Outer Space Treaty, which elaborates on the "common interest" and "freedom" principles and confirms that the exploration and use of outer space is to be undertaken "for the benefit and in the interests of all countries" and freely "by all States without discrimination of any kind, on a basis of equality and in accordance with international law." In broad terms, the primary intent of Article II was to reinforce these concepts by confirming that principles of territorial sovereignty do not apply to outer space. Not only does this reflect the practice of States from virtually the beginning of the space age but it also helps to protect outer space from the possibility of conflict driven by territorial or colonizing ambitions.

There has, however, been one notable exception in this regard – the Bogota Declaration. In 1976, a number of equatorial States – including Brazil, Colombia, the Congo, Ecuador, Indonesia, Kenya, Uganda, and Zaire – issued the Bogota Declaration, in which they claimed sovereign rights over segments of geostationary synchronous orbit above their respective territories. They asserted their claims principally because of the lack of an accepted delimitation between airspace and outer space. Such assertions were strenuously opposed by other States and have not been successful.

In this regard, the sentiments reflected in Article II of the Outer Space Treaty are fundamental to the regulation of outer space and its exploration and use for peaceful purposes. It is for these reasons that a binding principle of non-appropriation is an essential element of international space law.

Unlike the corresponding provision in United Nations Convention on the Law of the Sea (UNCLOS) (1982) dealing with the high seas, Article II does not expressly limit itself to the purported actions of States; rather, the provision is drafted in more general terms, in that it seeks to prohibit specific actions that constitute a "national appropriation." One should note, however, that the Chinese version of the Outer Space Treaty differs in this respect from all other versions, in that it prohibits appropriation "through the state by asserting sovereignty, use, occupation or any other means." In accordance with Article XVII of the Outer Space Treaty, the Chinese version is "equally authentic" with all other versions. However, it has also been noted that the fact that the other four versions (English, Russian, French and Spanish) all concur on the text of the provision is significant, "the more so if they include the languages which were mostly used in negotiations of the Outer Space Treaty" (Kopal 2006). With the obvious exception of the reference to "by claim of sovereignty," there is no express limitation in Article II *only* to the actions of States. This has, over the years, given rise to frequent debate among commentators as to the

precise scope of the prohibition and, more particularly, the extent (if at all) to which "private property rights" (Harris 2004) may exist in outer space, notwithstanding (or perhaps as a result of) the terms of Article II.

In other aspects, the degree to which international law governs outer space is not entirely clear. The Outer Space Treaty affirms that activities in space are to be carried on "in accordance with international law," (UNGA 1967, Article III) but the fact that most existing international law at the time was developed for "terrestrial" purposes meant that it was not readily or directly applicable in every respect to this new paradigm of human endeavor. Moreover, the non-sovereignty aspect of outer space meant that any then existent national law (which, in any event, did not at that time specifically address space-related issues) would not prima facie apply to this frontier, and would not be the appropriate legal basis upon which to establish the initial framework for regulating the conduct of humankind's activities in outer space. It was clear, therefore, that, at the dawn of the development of "space law," specific international binding rules would be required to address the particular characteristics and legal categorization of outer space.

There is now a substantial body of law dealing with many aspects of the use and exploration of outer space, mainly codified in and evidenced by Treaties, United Nations General Assembly resolutions, national legislation, the decisions of national courts, bilateral arrangements, and determinations by Intergovernmental Organizations.

Five important multilateral treaties have been finalized through the auspices of UNCOPUOS (UNGA 1959). These are:

(i) 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (UNGA 1967)
(ii) 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (UNGA 1968)
(iii) 1972 Convention on International Liability for Damage Caused by Space Objects (UNGA 1972)
(iv) 1975 Convention on Registration of Objects Launched into Outer Space (UNGA 1975)
(v) 1979 Agreement Governing the Activities of States on the Moon and other Celestial Bodies (UNGA 1979)

The United Nations Space Treaties were formulated in an era when only a small number of countries had space-faring capability. The international law of outer space thus, at least partially, reflects the political pressures imposed by the superpowers at that time.

The United Nations General Assembly has also adopted a number of space-related Principles, which include:

(i) 1963 Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (UNGA 1963)

(ii) 1982 Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (UNGA 1982)
(iii) 1986 Principles Relating to Remote Sensing of the Earth from Outer Space (UNGA 1986)
(iv) 1992 Principles Relevant to the Use of Nuclear Power Sources in Outer Space (UNGA 1992)
(v) 1996 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 (UNGA 1996)

These sets of principles provide for the application of international law and the promotion of international cooperation and understanding in space activities, the dissemination and exchange of information through transnational direct television broadcasting via satellites and remote satellite observations of Earth, and general standards regulating the safe use of nuclear power sources necessary for the exploration and use of outer space. More recent "guidelines" have also been agreed relating to various other issues, including the problem of space debris (UNCOPUOS 2007).

In the context of the regulation of the exploration and use of outer space, these five sets of principles have therefore largely been considered as constituting "soft law" (Freeland 2012); however, a number of specific provisions may now represent customary international law.

Yet, despite all of these developments, it is clear that the existing legal and regulatory regime has not kept pace with the remarkable technological and commercial progress of space activities since 1957. This represents a major challenge in relation to the ongoing development of effective legal principles, all the more in view of the strategic and military potential of outer space in an era of globalization.

Principles Regulating the "Military" Uses of Outer Space

The Outer Space Treaty provides a number of general principles that are intended to restrict the military uses of outer space, including the requirement that activities in the exploration and use of outer space shall be carried out "in accordance with international law, including the Charter of the United Nations" (UNGA 1967, Article III). One of the primary drivers behind the inclusion of this provision was the concern among many States that outer space would become a new arena for international conflict. Article 2 of the Moon Agreement extends these sentiments by referring to "the Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations" (UNGA 1970).

As noted, many of the fundamental principles that formed the basis of the Outer Space Treaty were concluded at a time when the world was in the midst of uncertainty and mistrust, largely as a result of the prevailing geopolitical environment of the Cold War. At the time, there was a genuine fear held by the international

community that outer space would be utilized for military purposes, as well as concern that it could perhaps ultimately become a theatre of war. In December 1958, the United Nations emphasized the need "to avoid the extension of present national rivalries into this new field" (UNGA 1958).

By 1961, the General Assembly had recommended that international law and the United Nations Charter should apply to "outer space and celestial bodies" (UNGA 1961). This was repeated in General Assembly Resolution 1962, which set out a number of important principles that were ultimately incorporated into the Outer Space Treaty (UNGA 1963). The specific reference to the United Nations Charter was considered to be important, given that the maintenance of international peace and security is the underlying principle of the system established under that instrument (UN 1945).

The sentiments underlying the United Nations Charter were strengthened further by the restrictions imposed in relation to nuclear weapons and weapons of mass destruction by Article IV of the Outer Space Treaty, although, as has been well documented by leading commentators, this provision in and of itself does not represent a complete restriction on the placement of weapons in outer space, nor of their use (Schrogl and Neumann 2009). Indeed, there have been, from time to time, proposals put forward to amend Article IV in order to enhance these restrictions, but this has not (yet) eventuated (Bogomolov 1993).

The "peaceful purposes" provision set out in Article IV of the Outer Space Treaty has been the subject of much analytical discussion as to its scope and meaning. While there exists some consensus among space law commentators – but not complete unanimity – that this provision is directed against "nonmilitary" rather than merely "nonaggressive" activities, the reality has been different. As noted, it is undeniable that, in addition to the many commercial, civilian, and scientific uses, outer space has and continues to be used for an expanding array of military activities. Gone are the days where there existed only two superpowers leading the world in space technology and exploration. The modern space age sees a new space race that exists among existing and emerging powers. It has now been established that competitive capabilities in outer space directly correlate to strategic and military capabilities on Earth.

In this context, if one were to adopt a hard-line pragmatic view, the "nonmilitary vs. nonaggressive" debate relating to the peaceful purposes requirement is a redundant argument, even though it represents an extremely important issue of interpretation of the strict principles of international space law. This then assumes that the militarization of space is a given, as much as it may pain international and space lawyers to admit this.

Moreover, Article 51 of the United Nations Charter – which confirms the "inherent right" of self-defense "if an armed attack occurs" – is also applicable to the legal regulation of outer space. Under the principles of public international law, this right remains subject to express legal limitations – the requirements of necessity and proportionality (ICJ 2003). Even where the right of self-defense is lawfully exercised, the State so acting will remain subject to the laws of war. While this is, in theory, uncontroversial, the difficulty is to determine precisely whether (and how)

these fundamental principles can be applied to the unique legal and technological context of outer space.

This is particularly relevant given that the use of satellite technology already represents an integral part of the military strategy and the conduct of many armed conflicts. With space capabilities and technology developing at a rapid pace, any case of armed conflict in the twenty-first century and beyond will continuously involve the utilization of outer space. This is the direction and environment that the current political climate it operates in.

While the weaponization of space flies in the face of the principles of the Outer Space Treaty, it would be naive to ignore the realities of the twenty-first century. It would rather be more pragmatic to understand both what (and how) existing legal principles, including the rules of the laws of war, apply to any military activities involving outer space and to determine what needs to be done to provide, at least from a regulatory perspective, an appropriate framework to protect humankind in the future.

The Laws of War: General Principles

Over time, the international community has gradually agreed upon the principles of the laws of war (also known as international humanitarian law or the *jus in bello*) designed to provide legal constraints applicable to the conduct of armed conflict. It is only relatively recently that these minimum international standards have been developed to regulate *how*, *with what*, and *against whom* wars could be fought. It is interesting to note that "war" as a concept was declared illegal by the 1928 Pact of Paris (Kellogg–Briand 1929). Facing the realities of the modern world, it is evident that armed conflict still continues and has become more complex over time. This is not only due to the rapidly developing technology that has become increasingly integral to the conduct of armed conflict but also to the increasing role of non-State actors in conflict. As such, the scope for cataclysmic destruction and loss of life has increased due to the development of sophisticated weaponry, which includes the use of space technology.

The origins of the "laws and customs of war" were from the customary practices of armies on the battlefield and has since developed as a principal branch of international law (Henckaerts and Doswald-Beck 2005). The application of these customary practices was not uniform, and it therefore became evident that more formalized standards were required. A major step forward in the development of the rules of war, which inter alia limit the method and means of conducting warfare and also provide for classes of protected persons and protected objects, came with the Brussels Conference of 1874 and, more significantly, The Hague Peace Conferences of 1899 and 1907, which gave rise to some important standard-setting treaties that are still applicable today. The 1899 Conference concluded that "[t]he right of belligerents to adopt means of injuring the enemy is not unlimited" (U.K.T.S. 1899).

As time went on, further treaties followed, each specifying in greater detail the limits of what constituted (un)acceptable behavior in the context of armed conflict.

For instance, those provisions of the Hague Conventions that applied the laws of war to restrict the use of poison or poisoned weapons and asphyxiating gases were further extended by the 1925 Geneva Protocol (L.N.T.S. 1929).

The scars of the Second World War demonstrated the inadequacy of the existing rules, especially in respect to the treatment of civilians and noncombatants. The critical four 1949 Geneva Conventions were concluded to address these issues, (UNGA 1929, 1949a, b, c, d) and these were strengthened by the Additional Protocols of 1977 (UNGA 1949a, b, c, d, 1977). There have also been a growing number of other important treaties that have added to the corpus of international humanitarian law and the rules regulating armed conflict, particularly in relation to restrictions on specific weapons and means of warfare. Among these are several treaties that relate to the use of outer space, including those limiting the testing of nuclear and other weapons (UNGA 1963, 1972, 1996, 1998), as well as the 1977 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) (UNGA 1977), which was the first instrument that dealt with deliberate destruction of the environment during warfare, although it also applies in time of peace.

International humanitarian law is now a well-developed area of international law, covering many aspects of terrestrial warfare. The obligations that arise under the fundamental principles of international humanitarian law, particularly those contained in The Hague Conventions and the Geneva Conventions and their Additional Protocols, have been reaffirmed by the United Nations Security Council (UNSC 2006). Moreover, the formation of multiple national, regional, and international enforcement mechanisms of justice – culminating in the International Criminal Court, the world's first permanent court of its kind – clearly indicates that the international community is determined that those senior officials (both military and political) who breach these established standards are to be held to account (Freeland 2006).

While there are many principles that have arisen through the evolution of the *jus in bello*, there are three specific concerns that form the basis of any decision to undertake an act of military engagement. They are the principles of distinction, military objective, and proportionality. Each of these is relevant to a consideration of the applicability of the laws of war to the use of outer space. Many commentators combine issues of distinction and military objective into a broader principle known as "discrimination." However, by differentiating between these two issues, it emphasizes the need to distinguish between civilians and combatants without reference to sometimes subjective considerations as to what constitutes a military target in the context of military advantage.

Distinction

Under the principle of distinction, deliberate attacks against civilians and noncombatants are prohibited. Article 48 of Additional Protocol I provides inter alia that "[i]n order to ensure respect for and protection of the civilian population . . . the Parties

to a conflict shall at all times distinguish between the civilian population and combatants" (UNGA 1977). In addition, those engaged in armed conflict must not use weapons that are incapable of distinguishing between combatants and non-combatants. These represent fundamental concepts in the conduct of military activities and illustrate the strong linkages between the scope of international humanitarian law and the development of formal legal principles for the human rights of the individual. In his Dissenting Opinion in *Legality of the Threat or Use of Nuclear Weapons*, Judge Koroma pointed out that "both human rights law and international humanitarian law have as their *raison d'être* the protection of the individual as well as the worth and dignity of the human person, both during peacetime or in an armed conflict" (Koroma 1996).

Military Objective

The principle of military objective asserts that attacks not directed at a legitimate military target are prohibited. The important issue is the need to distinguish between civilian persons or objects and military objectives – comprising the elements of "effective contribution to military action" and "definite military advantage" specified in Article 52 of Additional Protocol I (UNGA 1977). Article 52 of Additional Protocol I provides inter alia that "[i]n so far as objects are concerned, military objectives are limited to those objects which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage" (UNGA 1977).

Proportionality

The principle of proportionality promulgates that even when attacking a legitimate military objective, the extent of military force used and any injury and damage to civilians and civilian property should not be disproportionate to any expected military advantage. This standard demands an assessment of any potential "collateral damage" in the case of military action. However, in practice, it is often difficult to apply the proportionality principle given that different people and States ascribe differing relative "values" to military advantage *vis-à-vis* civilian injury and damage. One only need recall the Advisory Opinion in the *Legality of the Threat or Use of Nuclear Weapons*, where the International Court of Justice, while noting that the threat or use of a nuclear weapon should comply with the requirements of international law relating to armed conflict, in particular, the principles of international humanitarian law, could not say categorically that the threat or use of nuclear weapons would in every circumstance constitute a violation of international law (ICJ 1996).

The Relevance of the Laws of War to Outer Space

As noted above, the existing principles of international humanitarian law, as an integral part of international law, are, in theory, applicable to the military use of outer space. There is no specific "territorial" limitation to the laws and customs of war, which apply both to the area where the hostilities actually take place, as well as to other areas affected by those hostilities. If, for example, direct military action takes place in one area, but the effects of that action impact on civilians elsewhere, that represents a relevant consideration in determining whether such action is consistent with, for example, the principle of proportionality. As a result, any military activity that takes place in outer space will prima facie be subject to the *jus in bello* in relation not only to that direct action but also as to its effects and consequences elsewhere, including on Earth.

Having reached this conclusion, it is then necessary to determine whether the rules of war are "relevant" to activities in outer space. Looking at past and current events, the answer appears self-evident. During the Gulf War in 1990, the military value of space assets were first utilized for the conduct of warfare. Indeed, "Operation Desert Storm" is regarded as "the first space war" (Maogoto and Freeland 2007). It was recognized that the use of space technology would create an "integrated battle platform" to aid in the implementation of military strategy. Following the attacks of 11 September 2001, the United States Administration embarked on a policy designed to dominate the space dimension of military operations. This necessitates having the ability to protect critical US infrastructure and assets in outer space. The United States' approach to military advantage has now become heavily reliant upon space capabilities. The latest announcement from the Trump Administration establishing a "Space Force" further indicates the pivot of the United States military towards outer space, an area that it has increasingly designated as the newest "war-fighting domain."

Further, the reliance on space assets by other leading space-faring nations such as Russia and China illustrates the global space race that is developing in outer space. China has been rapidly consolidating its status as a space power, adding further to the tensions relating to space-related weapons technology. The first Gulf War demonstrated to China's military leadership the importance of high-tech integrated warfare platforms, and the ability of sophisticated space-based command, control, communications, and intelligence systems to link land, sea, and air forces. While one of the strongest motivations for China's space program appears to be political prestige and scientific exploration, China's space efforts will almost certainly contribute to the development of improved military space systems.

While not the leading space-faring power that it once was at the height of the Cold War, Russia still maintains a strong focus on developing its space capabilities and striving for technical dominance in this domain. The European Union has also identified outer space as "a key component for its European Defence and Security Policy" (Hagen and Scheffran 2005). Even for smaller countries such as Australia,

the political landscape of national space policy highlights military and national security concerns (Freeland 2010a).

In this context, several commentators have opined that space warfare is, in fact, inevitable and cannot be avoided (De Angelis 2002). If these assertions turn out to reflect reality, the principles of the laws of war should be applied. However, it is not clear how this will be done in practice and what consequences will follow.

One complicating factor in this analysis is the increasing prevalence of what are referred to as "dual-use" satellites. The concept of a dual-use facility or resource – typically a commercial facility or resource that is also utilized by the military for military purposes – has become a common feature of contemporary technological society. This presents particular difficulties for those conducting armed conflict, since an asset that could prima facie be regarded as a legitimate military target on the basis of military objectives (see further below) might also – even at the same time – be operating for civilian/commercial uses. It is sometimes very difficult, or indeed impossible, to "quarantine" what is the civilian/commercial aspect of a facility from the military component. Additionally, military "customers" are now regularly utilizing commercial satellites to undertake military activities. In this respect, the language of the international law instruments relating to outer space has not hampered the increasing utilization of satellite technology for an expanding array of military activities.

One terrestrial example is illustrative of the difficulties of engaging in a straightforward legal analysis of any attack against such a facility. During the 1999 NATO bombing campaign directed towards forcing the Serbian military to leave Kosovo (known as "Operation Allied Force"), one deliberate target was the RTS Serbian TV and Radio Station in Belgrade. NATO missiles destroyed the station on 23 April 1999, with significant – and only civilian – loss of life. The bombing of the TV studio was part of a planned attack aimed at disrupting and degrading the C3 (Command, Control, and Communications) network of the Government of the Former Yugoslavia.

At a press conference on 27 April 1999, NATO officials justified this attack in terms of the dual military and civilian use to which the communication system was routinely put (NATO 2000; Freeland 2002). In essence, NATO stressed the dual-usage to which such communications systems were put, emphasizing the fact that "military traffic is . . . routed through the civilian system" (NATO 2000).

This concept is, as noted above, also a common feature of space technology. A combination of factors – the increasing dependence by military and strategic forces within (the major) powers on the use of satellite technology; the inability of Governments to satisfy such demands for reasons associated either with costs or the lack of technological expertise (or both); and the advent of commercial satellite infrastructure and services that are responsive, technologically advanced, available, and appropriate to meet these demands – means that military "customers" are now regularly utilizing commercial satellites to undertake military activities. Given that such an increasingly important group of space assets used for military purposes are these dual-use satellites, one is also drawn to the question of whether, and in what circumstances, such a satellite can (ever) be regarded as a legitimate target of war.

The answer will depend upon a number of fundamental principles of international law. Clearly, the physical destruction of a satellite constitutes a use of force. Apart from a consideration of the principles in the United Nations Space Treaties, one would have to determine whether such an action represents a legitimate (at law) use of force, with the only possible justification being Article 51 of the United Nations Charter.

For example, assume that a combatant regards a dual-use satellite – in this scenario, a GPS or remote sensing satellite – as representing a legitimate military objective in accordance with the principles of distinction and military advantage. Even if this were a correct assessment, the principle of proportionality would also apply. Moreover, one could argue that, implicit in the principle of distinction is the obligation on the parties to a conflict to take "all feasible precautions" to protect civilians from the effects of an attack (Henckaerts and Doswald-Beck 2005). There would also be adverse environmental consequences (including significant space debris) resulting from the destruction of a satellite, and various international environmental law principles would therefore also be applicable in these circumstances.

One can certainly envisage that the deliberate destruction of such a satellite could, even if it does not result in any immediate civilian casualties, have a devastating impact on communities, countries, or even regions of the world. Millions of lives and livelihoods could, potentially, be affected, economies destroyed, and essential services incapacitated. Naturally, some of the consequences of such an attack may be difficult to foresee, but it would, one could argue, be regarded at the least as reckless. However, there is likely to be some uncertainty as to whether and how a "recklessness" test is to be applied in such a situation (Freeland 2002).

Overall, given the unique nature of outer space, the fundamental principles of the laws of war – developed to regulate *terrestrial* warfare and armed conflict – are probably neither sufficiently specific nor entirely appropriate for military action in outer space. Even though every effort should be made to apply the existing principles as directly as possible, the largely unprecedented nature of such an environment means that more specific rules will almost certainly be required, if they are to provide a comprehensive framework to properly protect humanity from the disastrous consequences of outer space becoming another theatre of warfare.

Regulating the Threat of Space Warfare: Some Recent Initiatives

There is reluctance among the major powers to address the question of international space law regulation through the use of binding treaty instruments. As such, a voluntary soft law approach has been preferred, such as utilizing "transparency and confidence building measures" (TCBMs). A principal TCBM in the area of space regulation had been the (draft) International Code of Conduct for Outer Space Activities (CoC), which was initially developed as a European initiative but has since become broader in scope (European External Action Service 2014). Discussions in 2015 intended to facilitate agreement on this instrument failed, with the instrument now not seriously referred to in relevant fora.

Space debris, an issue that was addressed in the draft CoC, is increasingly becoming a signification risk to operations in outer space as on-orbit collisions can have catastrophic repercussions and leads to further creation of debris. Related to the issue of space debris is, of course, the issue of maintaining the integrity of space assets, both in terms of adhering to measures on debris control and mitigation as well as remediation. Equally it serves to minimize the possibility that a state would destroy another state's satellite (and in the process almost certainly create additional space debris).

Another approach was that of the Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects (PPWT). Since the early 1980s, there have been a series of United Nations General Assembly (UNGA) Resolutions on the specific issue of preventing an arms race in outer space. Such Resolutions focused on addressing this issue and drew further attention of the international community to the need to respond to various military initiatives taken by major space powers in their use of outer space. Ostensibly responding to these calls, in February 2008, the then Minister of Foreign Affairs of the Russian Federation, Sergey Lavrov, presented a draft document headed "Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects" to the 65 members attending the Plenary Meeting of the United Nations Conference on Disarmament (CD) in Geneva. The PPWT had been developed by Russia and China, two of the major space superpowers in the world.

The formal submission of the PPWT to the CD followed several years of diplomatic discussion, directed towards agreeing the terms of legally binding rules addressing the dangers of an arms race in space. In general terms, the PPWT focused on three primary obligations of States Parties, each of which are specified in Article II: not to place in orbit around the Earth, install on celestial bodies, or station in outer space in any other manner "any objects carrying any kind of weapons"; not to "resort to the threat or use of force against any outer space objects"; and not to encourage another State(s) or Intergovernmental Organization to "participate in activities prohibited" by the PPWT.

In responding to the PPWT, the United States Administration has continually reiterated that it opposes any treaty that seeks "to prohibit or limit access to or use of space," adding that, in any event, such a treaty would be impossible to enforce. Indeed, verification measures in relation to the obligations of State Parties under the PPWT would undoubtedly prove to be difficult and complex – though perhaps not impossible – to implement. Instead, the United States has indicated that it prefers "discussions aimed at promoting transparency and confidence building measures."

Overall however, and despite its shortcomings, the PPWT has raised issues of crucial importance to the future use and exploration of outer space, indeed to the very nature of space activities. It was therefore unfortunate that the document was so quickly rejected out of hand by the United States. Indeed, in February 2008, barely a week after Russia and China submitted the PPWT to the CD, the United States fired an SM-3 missile from USS Lake Erie that destroyed a failed satellite approximately 150 km above the Pacific Ocean. Although the United States argued that this action

was necessary to prevent the fuel tank of the satellite – containing hydrazine – from breaking up and polluting the atmosphere, others have suggested that this was simply a "test" by the United States of its anti-satellite capability.

Yet, despite these setbacks, the formal submission of the PPWT by two of the world's space superpowers has had the effect of generating further momentum in relation to other initiatives to address the impending perils associated with the possible weaponization of space, for instance, the draft CoC.

While there are obvious benefits in developing greater trust between the space powers in issues relating to space security, the danger of the aforementioned TCBMs is that they are nonbinding TCBM. For all practical purposes, they considered as the "end game" on this issue, so that the formalization of binding obligations may *never* emerge.

At its core, the draft CoC provisions, for example, are merely guidelines or recommendations that do not have the force of law, unless they are to be regarded as reflecting rules of customary international law, itself a very difficult assertion to substantiate in the absence of, say, a ruling by the International Court of Justice. This approach appears inadequate to meet the complex risks associated with the continued development of space-related weapons.

Conclusion: Perspectives on the Way Forward

The above brief discussion gives rise to several conclusions and reflections: first, present indications suggest that there is an increasing likelihood that outer space will not only be used to facilitate armed conflict (as it already is) but will ultimately become a theatre of war. The tendency of the major superpowers to unequivocally rely on space technology has spurred a space weapons race, despite the efforts of the international community. Even though the United States may currently claim space superiority, leading nations such as China and Russia closely follow behind and have access to equally sophisticated (and potentially devastating) space weapons technology.

Secondly, the development of such technology and the increasing range of military uses of outer space heighten the dangers of a space war. The proliferation of crucial military space assets means that, from a military and strategic viewpoint, the disabling or destruction of satellites used by another country may be perceived as giving rise to very significant advantages. The fact that it has not happened in the past is no reason to assume that we will never see a space conflict.

Thirdly, all countries in the world are highly dependent on space technology to maintain and improve their livelihood and standard of living. The nonmilitary uses of space have become vital aspects of any community's survival. At the same time, however, many of the satellites providing these commercial and civilian services are dual-use, in that they are also utilized for military and strategic purposes. This raises difficult questions about the "status" of such assets under the rules of war – particularly as to whether they may, under certain circumstances, be regarded as legitimate military objectives.

Fourthly, the Outer Space Treaty, which also reflects customary international law, specifies that the rules of international law apply to the use and exploration of outer space. These include not only the *jus ad bellum* principles regulating the use of force but also the principles of the laws of war. Respect for these rules is absolutely vital for the safety and security of humankind, as well as the interests of future generations. However, with the exception of those treaties that seek to ban the use and testing of certain types of weapons, as discussed there are many uncertainties that arise when one seeks to apply, in particular, the laws of war to a space conflict. The consequences of a space war are potentially so great and unknown that one cannot be sure as to exactly how these existing rules are to apply.

Fifthly, if we are to avoid "gray areas" in the law, it is therefore necessary to develop specific and clear rules and standards that reduce the weaponization of outer space, as well as any form of conflict in the region of outer space and against space assets. The Outer Space Treaty, as well as the other United Nations Space Treaties, do not currently provide stringent rules or incentives to prevent an arms race in outer space, let alone a conflict involving (and perhaps "in") space. This may, therefore, require additional specific legal regulation of outer space that is directly applicable to armed conflict involving the use of space technology. The position is, of course, further complicated by the applicability of the right of self-defense, a right that States will never abandon.

As part of these new rules, clear definitions must be developed for concepts such as "space weapons," "peaceful purposes," and "military uses." Moreover, the fundamental issue of "where space begins" should be definitively resolved, so as to counter any arguments that outer space is, in fact, an area akin to the territory of a State for the purposes of national security.

Sixthly, at the same time, careful consideration must be given to the application of the principles of the laws of war to this new paradigm of potential conflict. While, of course, there already exist very well established fundamental rules regulating terrestrial warfare, it is not clear whether these are entirely sufficient to protect humanity from the consequences of any future "space wars." Ultimately, the legal regulation of outer space is not likely to take the form of binding treaty obligations which supplement the existing laws of war (as they may apply to such activities) in the short-medium term, but rather will be on a voluntary nonbinding basis. This illustrates the sensitivities related to further regulating outer space activities that relate to issues of national security interests, particularly those of the major space powers.

It seems that a "softly, softly" approach involving the development of TCBMs is the preferred strategy, particularly of the United States, but this brings with it much more uncertainty, a lack of formal enforcement capability and enforcement mechanisms, and the possibility of undue flexibility of approach by the main global players. It is imperative on all stakeholders to find a path forward, in order to meet the challenges of the twenty-first century. The existing international regulatory framework, while important, cannot alone stand up to the unknowns that military-related space technology imposes upon us. It is critical that an appropriate and acceptable regulatory regime is found; however, the mechanism and conformity that this might take still remains unclear, particularly considering the distinct complexities that outer space presents.

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See United Nations General Assembly Resolution 1472 (XIV) on International Cooperation in the Peaceful Uses of Outer Space (12 December 1959). UNCOPUOS currently has 87 Members, which, according to its website, means that it is ‘one of the largest Committees in the United Nations.’ For more see http://www.unoosa.org/oosa/en/members/index.html. Last accessed 18 Feb 2019