

Steven Freeland

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Abstract

The international regulation of outer space is “embedded” in international law. It is not an esoteric and separate paradigm. Indeed, the main United Nations Space Treaty, the Outer Space Treaty, expressly confirms that the principles of international law apply to the use and exploration of outer space. Given the development of technology, outer space is more frequently being used during the course of armed conflict, particularly through the use of sophisticated satellite technology, notwithstanding the “peaceful purposes” provisions of that Treaty. Not only does this give

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S. Freeland
University of Western Sydney, Australia
e-mail: s.freeland@uws.edu.au

rise to difficult international law issues relating to the use of force, but it also requires an understanding of how and to what extent the international law principles of *jus in bello* – international humanitarian law – apply to the conduct of these outer space activities. The position is complicated further by the growing number of “dual use” satellites that simultaneously provide capacity to both commercial/civilian users and the military. This chapter examines a number of specific aspects of the *jus in bello* principles as they relate to the use of outer space, as well as more recent initiatives aimed at attempting to provide further clarity to the applicable rules. Although international humanitarian law does apply to activities in outer space, the existing 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. There is therefore a growing need to reach a consensus on additional legal regulation directly applicable to the conduct of armed conflict that may involve the use of space technology.

6.1 Introduction

It is now more than 50 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 over 1,400 times during the following 3-month period. This milestone heralded the dawn of the space age, 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 have developed that 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. The prospects for the future use of outer space offer both tremendous opportunities and challenges for humankind, and law will continue to play a crucial role in this regard.

One of the crucial elements in this matrix of legal regulation is the avoidance of armed conflict in outer space. It is no coincidence that the space race emerged at the height of the Cold War, when both the United States and the USSR strove to flex their respective technological “muscles.” This was a period of quite considerable tension, with the possibility of large-scale and potentially highly destructive military conflict between the (space) superpowers of the time always lurking in the background. Indeed, it was only a few short years after Sputnik I that the world held its breath during the so-called Cuban Missile Crisis in October 1962. Within this highly sensitive context, it was vital that efforts were made by the international community to regulate this new frontier – outer space – to avoid a buildup of weapons in space (in more modern parlance, referred to as the “prevention of an arms race in outer space” (PAROS)).

However, the conventional obligations and restrictions that were eventually agreed and codified in the major space treaties were, as described below, neither entirely clear nor sufficiently comprehensive to meet all of these challenges.

While most space scholars would interpret the relevant provisions as prohibiting military space activities in outer space, this was not followed by the practice of those who had the capability to utilize space technology. With the benefit of hindsight, it is now clear that space has been utilized for military activities almost from the time of the very infancy of space activities.

Since those early days, the situation has, if anything, become significantly more complex, with potentially drastic and catastrophic consequences. Just as the major spacefaring nations have been undertaking what might be termed “passive” military activities in outer space since the advent of space technology, outer space is increasingly now being used as part of active engagement in the conduct of armed conflict (Ricks 2001). Not only is information gathered from outer space – through, for example, the use of remote satellite technology and communications satellites – used to plan military engagement on Earth, but space assets are now used to direct military activity and represent an integral part of the military hardware of the major powers. It is now within the realms of reality to imagine outer space as an emerging theatre of warfare.

With these developments in mind, this chapter focuses on the (possible) application of the current laws of war to the use of outer space. While it is clear that outer space has been and is being used for military purposes, what is not straightforward is precisely how various aspects of these activities are regulated at the international level. Instead, what appears from an analysis of the current position is that, to the extent that existing *jus in bello* principles are applicable to space-related activities, there are undoubtedly some circumstances in which their scope of application might not be satisfactory or appropriate, particularly given the unique environment of outer space.

Accordingly, this chapter will first describe a concrete example of how space “weaponization” and “militarization” is continuing, with very serious political consequences. It will then 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. Following on from this, there will be a brief description of the general principles that govern the laws of war, before a discussion of their relevance to outer space. This chapter will then outline a number of initiatives designed to (possibly) fill some of the lacunae that appear to exist within the current legal regime, before making some more general observations regarding the way forward in terms of legal regulation.

In the end, although the laws of war do (in theory) appear to 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. There is therefore a growing need to reach a consensus on additional legal regulation directly applicable to the conduct of armed conflict that may involve the use of space technology. This will require political will, close cooperation, and greater trust between the major space powers, supported by other States and the international

community, if a legal regime that is capable of providing more certainty and comfort is to be established, so as to lessen the chances of a conflagration involving space assets, with all of the negative and unknown consequences that this would entail.

6.2 A Case in Point: The Development of Ballistic Missile Defense Systems

On 14 December 2001, in an effort to consolidate its policy of “space control,” US President George Bush announced the withdrawal of the United States from the Treaty on the Limitation of Anti-Ballistic Missile Systems (ABM Treaty), by invoking Article 15 of that instrument.¹ The key reason given by President Bush for the decision to withdraw from the treaty was because it was outdated and a relic of the Cold War (Diamond 2001). However, there was a more practical purpose, since the ABM Treaty expressly prohibited the development, testing, and deployment of sea-based, air-based, space-based, and mobile land-based ABM systems.² As a result, withdrawal from the ABM Treaty removed conventional restrictions on the United States to develop what would otherwise have been expressly prohibited weapon systems and, in particular, space-based devices that it perceived as forming an integral part of its policy to ensure that it retained its military dominance.

The genesis of the 2001 decision by the Bush administration can be traced back to the first Gulf War. During that conflict, the Patriot batteries deployed by Israel helped make a case for the role of theatre missile defense. In light of this, pressure began building in the United States to either loosen or completely divest its antiballistic missile technology from the constraints of the ABM Treaty. On 5 December 1991, shortly after the conclusion of the Gulf War, the US Congress passed the Missile Defense Act of 1991 (Missile Defense Act of 1991, §§ 231–40). This legislative enactment put Congress on record as officially supporting a National Missile Defense program. It stated in part that (Missile Defense Act of 1991, § 232 (a) (1)):

¹Anti-Ballistic Missile Systems Treaty, U.S.- U.S.S.R., 26 May 1972, 23 U.S.T. 3435. Article XV of the ABM Treaty provides as follows:

“1. This Treaty shall be of unlimited duration.

2. Each Party shall, in exercising its national sovereignty, have the right to withdraw from this Treaty if it decides that extraordinary events related to the subject matter of this Treaty have jeopardized its supreme interests. It shall give notice of its decision to the other Party six months prior to withdrawal from the Treaty. Such notice shall include a statement of the extraordinary events the notifying Party regards as having jeopardized its supreme interests.”

See also Maogoto and Freeland (2007b).

²ABM Treaty, Article V.

[i]t is a goal of the United States to deploy an anti-ballistic missile system, including one or an adequate additional number of anti-ballistic missile sites and space-based sensors, that is capable of providing a highly effective defense of the United States against limited attacks of ballistic missiles.

Four years later, a bill was introduced in Congress entitled the Defend America Act (Defend America Act of 1995, § 1). Section four of that instrument provided that, within 1 year of its enactment, there should be at least one test of either an ABM interceptor based in space, a sensor in space capable of providing data directly to an ABM interceptor, or an existing air defense, theatre missile defense, or early warning system, so as to demonstrate the country's capability to counter strategic ballistic missiles or their elements in flight trajectory (Defend America Act of 1995, § 4).

In the same year, an almost identical provision was inserted into the Ballistic Missile Defense Act (National Defense Authorization Act For Fiscal Year 1996 1995). The legislation sought to allow deployment of multiple ground-based ABM sites to provide effective defense of the United States against a limited ballistic missile attack; unrestricted use of sensors based within the atmosphere and in space; and increased flexibility for the development, testing, and deployment of follow-on national missile defense systems. With the introduction of these initiatives, the future of the ABM Treaty was doomed, since it purported to restrain these emerging military and technological goals.

Since the 2001 decision to withdraw from the ABM Treaty, the United States has been actively pursuing innovative military technology that it considers as essential to its decision to not only establish a national ballistic missile defense system (BMD) but to also place important elements of it in strategic locations overseas. This strategy has led to a chorus of protests, particularly from the United States' principal military – and space – competitors, Russia and China. These protests intensified, specifically from the former, as a consequence of the decision by the United States in 2006 to locate parts of the system in Poland and the Czech Republic, following detailed bilateral talks with those two countries.

Although, following its election into power, the Obama administration initially halted the Eastern European part of the program, this has recently been revived in a new format, referred to as a “European Phased Adaptive Approach” (EPAA), involving a number of former communist bloc countries. While there had been some hope at the NATO summit in Lisbon in 2010 that the development of the BMD would proceed with Russia as a “partner,” this now appears far less likely (Ischinger 2012).

In early May 2012, US Assistant Secretary of Defense Madelyn Creedon argued at a conference in Moscow that the EPAA was not a threat to Russia and that missile defense cooperation was “in the national security interest of all parties: the U.S., NATO, and Russia alike” (Creedon 2012). Yet, almost immediately thereafter, Russia's most senior military commander, General Nikolai Makarov, responded by warning NATO that it would consider preemptive military strikes in Poland and Romania if a missile defense radar system and interceptors are deployed

in Eastern Europe (Kramer 2012). It is clear, therefore, that the development of such systems gives rise to considerable tensions and disagreements.³

At the same time, 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 had 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 immediate motivations for its space program appears to be political prestige, China's space efforts will almost certainly contribute to the development of improved military space systems.

Indeed, in January 2007, the Chinese military launched a KT-1 rocket that successfully destroyed a redundant Chinese Fengyun 1-C weather satellite, which it had launched in 1999, in low Earth orbit approximately 800 km above the Earth. This generated a great deal of alarm and unease in Washington and elsewhere, particularly as it indicated quite clearly the increasing technological capabilities of the Chinese military.⁴ With China predicted by many to become the ascendant superpower in the twenty-first century, this space technology rivalry (particularly regarding its military utility) among the major space powers appears to be intensifying.

Each of these developments indicates a rapidly expanding perception among these major powers of the need for space-based systems in support of military operations. This perception is being translated into reality by the very significant resources now devoted by each of them to the development of evermore effective (and potent) space-related weaponry. It is important, therefore, to consider how the existing international legal framework governing the regulation of outer space may apply to such developments. This involves a consideration of both the general principles of international space law and an analysis of those specific provisions that are directed towards regulating the military uses of outer space.

6.3 The International Legal Regulation of Outer Space

6.3.1 General Principles of Space Law

The journey of Sputnik I immediately gave rise to difficult and controversial legal questions, involving previously undetermined concepts. Some earlier scholarship considered the nature and scope of laws that might apply to the exploration and use of outer space, but only at a hypothetical level.⁵ However, history changed forever

³Compare, for example, the views of Ivo Daalder (permanent representative of the United States to NATO) in "A new shield over Europe," *International Herald Tribune*, 7 June 2012, 6, with those of Nikolai Korchunov (acting permanent representative of Russia to NATO) published on the same page, "You say defense, we see threat," *International Herald Tribune*, 7 June 2012, 6.

⁴See, for example, Gordon and Cloud (2007), Spiegel (2007).

⁵For a summary of the main academic theories relating to "space law" in the period prior to the launch of Sputnik I, see, for example, Lyall and Larsen (2009).

on that day in 1957. Suddenly, the reality of humankind's aspirations and capabilities with respect to outer space became apparent. The world had to react, quickly, to an unprecedented event in an unregulated legal environment, particularly because it was clear that this was just the dawn of a quest to undertake a wide range of space activities.

Moreover, these embryonic space activities, and the rapid development of space technology that subsequently followed, were largely driven at the time by the geopolitical situation – predominantly the state of Cold War that prevailed between the two major (space) powers, the United States and the USSR. It is clear that the desire for ever-increasing technological prowess was as much motivated by military considerations as a wish to explore and use space for other (scientific) purposes, although no doubt these were also of relevance. It was in this context that the international community had to react, as it walked a fine balancing line between the wishes of these two superpowers on the one hand, and a general sense of uncertainty as to where exactly these military-driven achievements might ultimately lead on the other.

It was not a coincidence, therefore, that, shortly after the Sputnik I launch, 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).⁶ 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,⁷ which subsequently converted it into a permanent body in 1959.⁸ UNCOPUOS is now the principal multilateral body involved in the development of international space law.

As to legal principles, first and foremost, Sputnik necessitated a clarification as to the legal categorization of outer space for the purposes of international law. As a preliminary matter, in order to be in a position to do this, one would naturally expect to require a legal definition of what constitutes outer space; i.e., where does outer space begin? Indeed, this was the first issue that the United Nations put to UNCOPUOS. While many theories have been proposed since then, quite remarkably (at least for those not involved in the diplomatic discussions), the question of

⁶Emphasis added.

⁷See United Nations General Assembly Resolution 1348 (XIII) on Questions on the Peaceful Uses of Outer Space (13 December 1958). The 18 States were Argentina, Australia, Belgium, Brazil, Canada, Czechoslovakia, France, India, Iran, Italy, Japan, Mexico, Poland, Sweden, the Union of Soviet Socialist Republics, the United Arab Republic, the United Kingdom of Great Britain and Northern Ireland and the United States.

⁸See United Nations General Assembly Resolution 1472 (XIV) on International Cooperation in the Peaceful Uses of Outer Space (12 December 1959). In addition to the original 18 States, Albania, Austria, Bulgaria, Hungary, Lebanon, and Romania were included at that time as member states of this permanent body. UNCOPUOS currently has 71 members (the latest being Azerbaijan in early 2012), which, according to its website, means that it is “one of the largest Committees in the United Nations”: <http://www.unoosa.org/oosa/en/COPUOS/members.html> (last accessed 8 June 2012). In addition to States, a number of international organizations, including both intergovernmental and nongovernmental organizations, have observer status with UNCOPUOS.

where air space “ends” and outer space “begins” has thus far remained unanswered from an international legal viewpoint.

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. This international (in)action confirmed that this new frontier of human activity did not possess the elements of sovereignty that had already been well established under the international law principles regulating land, sea, and air space on Earth. As was observed by Judge Manfred Lachs of the International Court of Justice (North Sea Continental Shelf Cases (Federal Republic of Germany v. Denmark and Federal Republic of Germany v. The Netherlands) 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.

However, 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 emerged quickly, although the negotiations directed towards expressing these into a conventional form took more time. This was due to a number of causes, including the unique environment with which it would have to deal, the very significant political and strategic factors at play, and the rapid growth of space-related technology that followed almost immediately from the Sputnik success.

Thus, almost immediately after humankind began its quest to explore and use outer space, a number of foundational principles of the international law of outer space were born – 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,⁹ with the result that they also constitute binding conventional rules, codifying what had already amounted to principles of customary international law. In essence, the community of States, including both of the major spacefaring States of the time, had accepted that outer space was to be regarded as being similar to a *res communis omnium* (Cassese 2005).

These three fundamental rules underpinning 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 territorial nature of air space is reflected in the principal air law treaties. For example, reaffirming the principle already acknowledged as early as in 1919, (Convention on the Regulation of Aerial Navigation 11 L.N.T.S. 173) the 1944 Convention on International Civil Aviation

⁹See, 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.

(15 U.N.T.S. 295a) provides that “every State has complete and exclusive sovereignty over the air space above its territory.”¹⁰

The International Court of Justice has confirmed that this characteristic of air space also represents customary international law.¹¹ As a consequence, civil and commercial aircrafts have only certain limited rights to enter the air space of another State (Articles 5 and 6, 15 U.N.T.S. 295b), in contrast to the freedom principle relating to outer space.¹² Even though, as noted above, 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.¹³

By contrast to the position regarding airspace, 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.¹⁴ 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 general terms, 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.

Indeed, 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; yet neither had made a claim to sovereignty over any part of outer space, including celestial bodies, notwithstanding the planting by the Apollo 11 astronauts

¹⁰Chicago Convention, Article 1. For the purposes of the Chicago Convention, the territory of a State is regarded as “the land areas and territorial waters adjacent thereto under the sovereignty, suzerainty, protection or mandate of such State”: Chicago Convention, Article 2.

¹¹In *Case Concerning Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States)* (Merits) (Judgment), the court noted that “[t]he principle of respect for territorial sovereignty is also directly infringed by the unauthorized overflight of a State’s territory by aircraft belonging to or under the control of the government of another State”: [1986] ICJ Rep 14, 128.

¹²Of course, any space activities requiring a launch from Earth and/or a return to Earth will also involve a “use” of air space. In this respect, the law of air space may be relevant to the legal position if, for example, the space object of one State travels through the air space of another State. See also Article II of the Liability Convention, which applies *inter alia* to “aircraft in flight” (i.e., in air space).

¹³However, 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 kilometers above the Earth: see Freeland (2010b).

¹⁴For a detailed analysis of Article II of the Outer Space Treaty, see Freeland and Jakhu (2009).

of an American flag on the surface of the Moon.¹⁵ 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 spacefaring 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 general terms, the primary intent of Article II was to reinforce these important 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,¹⁶ but it also helps to protect outer space from the possibility of conflict driven by territorial or colonizing ambitions.

In this regard, the US delegate to UNCOPUOS, Mr. Herbert Reis, reiterated the specific object and purpose of Article II on 31 July 1969, just a matter of days after the Apollo 11 astronauts had landed on the Moon, as follows (Valters 1970):

The negotiating history of the Treaty shows that the purpose of this provision (i.e. Article II) was to prohibit a repetition of the race for the acquisition of national sovereignty over overseas territories that developed in the sixteenth, seventeenth, eighteenth and nineteenth centuries. The Treaty makes clear that no user of space may lay claim to, or seek to establish, national sovereignty over outer space.

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, to be preserved and followed in the conduct of all activities in outer space.

Unlike the corresponding provision in United Nations Convention on the Law of the Sea (UNCLOS) dealing with the high seas, Article II does not

¹⁵This 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.

¹⁶There 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.

expressly limit itself to the purported actions of States¹⁷; rather, the provision is drafted in more general terms, in that it seeks to prohibit specific actions that constitute a “national appropriation.”¹⁸ 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” (Article III, 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies), 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.

The law of outer space has developed as a body of law that is embedded within general public international law. Since the launch of Sputnik I, this process of evolution has been remarkably rapid, largely driven by the need to agree on rules to regulate activities in this new “frontier.” There is now a substantial body of law dealing with many aspects of the use and exploration of outer space,

¹⁷But note UNCLOS, Article 137(1), which provides that:

“No State shall claim or exercise sovereignty or sovereign rights over any part of the Area or its resources, nor shall any State or *natural or juridical person* appropriate any part thereof. No such claim or exercise of sovereignty or sovereign rights nor such appropriation shall be recognized” (emphasis added).

¹⁸One 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]”: V. Kopal, “Comments on the issue of ‘Adequacy of the Current Legal and Regulatory Framework Relating to the Extraction and Appropriation of Natural Resources of the Moon’” in Institute of Air and Space Law, McGill University, *Policy and Law Relating to Outer Space Resources: Examples of the Moon, Mars, and other Celestial Bodies*, Workshop Proceedings (28–30 June 2006) 227, 230.

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.¹⁹ 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 (610 U.N.T.S. 205a)
- (ii) 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (672 U.N.T.S. 119)
- (iii) 1972 Convention on International Liability for Damage Caused by Space Objects (961 U.N.T.S. 187)
- (iv) 1975 Convention on Registration of Objects Launched into Outer Space (1023 U.N.T.S. 15)
- (v) 1979 Agreement Governing the Activities of States on the Moon and other Celestial Bodies (1363 U.N.T.S. 3)

Among other important principles, these United Nations Space Treaties confirm that the use and exploration of outer space is to be for “peaceful purposes,” (Article IV, 610 U.N.T.S. 205b) although this principle has been highly controversial – arguments still persist as to whether this refers to “nonmilitary” or “nonaggressive” activities (see further below). The United Nations Space Treaties were formulated in an era when only a small number of countries had spacefaring 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 (United Nations General Assembly Resolution 1962 (XVIII) on the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space 1963a)
- (ii) 1982 Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (United Nations General Assembly Resolution No 37/92 on the Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting 1982)
- (iii) 1986 Principles Relating to Remote Sensing of the Earth from Outer Space (United Nations General Assembly Resolution No 41/65 on the Principles relating to Remote Sensing of the Earth from Outer Space 1986)

¹⁹UNCOPUOS was established by the United Nations General Assembly in 1959, shortly after the successful launch of Sputnik 1: see United Nations General Assembly Resolution 1472 (XIV) on International Cooperation in the Peaceful Uses of Outer Space (1959).

- (iv) 1992 Principles Relevant to the Use of Nuclear Power Sources in Outer Space (United Nations General Assembly Resolution No 47/68 on the Principles relevant to the Use of Nuclear Power Sources in Outer Space 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 (United Nations General Assembly Resolution No 51/122 on 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 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 the 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.²⁰

It is generally agreed that Resolutions of the United Nations General Assembly are non-binding, at least within the traditional analysis of the “sources” of international law specified in Article 38(1) of the Statute of the International Court of Justice.²¹ In the context of the regulation of the use and exploration of outer space, these five sets of principles have therefore largely been considered as constituting “soft law” (Freeland 2012), although 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.

²⁰See, for example, UNCOPUOS (2007)

²¹1 U.N.T.S. 16 (ICJ Statute). It is generally asserted by international law scholars that article 38(1) of the ICJ Statute lists the so-called sources of international law: see, for example, Schwarzenberger (1957), Cassese (2005). Article 38(1) of the ICJ Statute provides as follows:

“The Court, whose function is to decide in accordance with international law such disputes as are submitted to it, shall apply:

- a. international conventions, whether general or particular, establishing rules expressly recognized by the contesting states;
- b. international custom, as evidence of a general practice accepted as law;
- c. the general principles of law recognized by civilized nations;
- d. subject to the provisions of Article 59, judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary means for the determination of rules of law.”

6.3.2 Principles Regulating the “Military” Uses of Outer Space

As noted, 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.”²² One of the primary reasons for the inclusion of this provision was the concern among many States that outer space would become a new arena for international conflict. As a leading commentator, Bin Cheng, once aptly put it, “outer space brought with it a whole new ball game” (Cheng 1998).

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. Almost as soon as Sputnik I was launched, the international community was concerned about the use of outer space for military purposes as well as the fear 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” (United Nations General Assembly Resolution 1348 (XVIII) on the Question of the peaceful use of outer space 1958).

By 1961, the General Assembly had recommended that international law and the United Nations Charter should apply to “outer space and celestial bodies” (United Nations General Assembly Resolution 1721 (XVI) on International co-operation in the peaceful uses of outer space 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 (United Nations General Assembly Resolution 1962 (XVIII) on the Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space 1963b). 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.²³ The prohibition on the use of force contained in Article 2(4) of the United Nations Charter represents a crucial element in the regulation of international relations and is equally applicable to the use of outer space.²⁴

²²Outer Space Treaty, article III. 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, adopted by the General Assembly on 25 October 1970.”

²³1 U.N.T.S. xvi (892 U.N.T.S. 119). The first “Purpose” of the United Nations specified in article 1(1) of the United Nations Charter begins with the words: “To maintain international peace and security . . .”

²⁴Article 2(4) of the United Nations Charter provides: “All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations.”

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.²⁵ 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.²⁶

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 is general agreement – but not complete unanimity – among space law commentators that this is directed against “nonmilitary” rather than merely “nonaggressive” activities, the reality has, unfortunately, 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. Unless concrete steps are taken to arrest this trend – which will require a significant shift in political will, particularly among the major powers – it is likely that space will increasingly be utilized to further the military and strategic aims of specific countries, particularly as military and space technology continues to evolve and develop.

In this context, if one were to adopt a hard-line pragmatic view, it seems that 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. In one sense, this assumes that the militarization of space is a given, as much as it pains 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.²⁷ 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. As this technology continues to develop, the armed conflicts of the twenty-first century and beyond will increasingly involve the utilization of outer space.

²⁵For a detailed analysis of Article IV of the Outer Space Treaty, see Schrogl and Neumann (2009).

²⁶See, for example, Bogomolov (1993), where the author refers to a failed Venezuelan proposal to amend Article IV.

²⁷See *The Caroline Case* 29 B.F.S.P. 1137–1138; 30 B.F.S.P. 195–196, which also referred to a requirement of immediacy, although this was not mentioned in the more recent decision of the International Court of Justice in *Oil Platforms (Merits) (Iran v. United States)* [2003] ICJ Rep. 161.

In this regard, the United Nations is anxious to avoid a “weaponization” of outer space.²⁸ However, the current political momentum does, unfortunately, appear to be directed towards a greater incorporation of satellite technology in outer space as part of the course of warfare.

This is highly troubling and flies in the face of the principles of the Outer Space Treaty. Yet, it would be naive to ignore the realities – rather it is important both to understand 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.

6.4 The Laws of War: General Principles

The principles of the laws of war (also known as international humanitarian law or the *jus in bello*) have emerged over time, as the international community has gradually agreed that there should be certain legal constraints applicable to the conduct of armed conflict. Wars have been with us since time immemorial and it has only been relatively recently that minimum international standards have been developed to regulate *how*, *with what*, and *against whom* they could be fought – in effect the rules that have developed are “intended to limit the terrible effects of war” (Legality of the Threat or Use of Nuclear Weapons 1996). Even though “war” as a concept was declared illegal by the 1928 Pact of Paris,²⁹ it is evident that armed conflict still continues and has become more complex, particularly given the increasing role of non-State actors. Moreover, the scope for cataclysmic destruction and loss of life has also increased due to the development of sophisticated weaponry, which includes the use of space technology.

The “laws and customs of war” had its origins in the customary practices of armies on the battlefield and has developed as an important branch of international law (Henckaerts and Doswald-Beck 2005, p. xxv). 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

²⁸Refer to the numerous United Nations General Assembly Resolutions, beginning with Resolution 36/97C (1981), which have all been directed towards the “Prevention of an arms race in outer space.”

²⁹Article I of the *General Treaty for the Renunciation of War* U.K.T.S. (1929) 29 provides:

“The High Contracting Parties solemnly declare in the names of their respective peoples that they condemn recourse to war for the solution of international controversies, and renounce it as an instrument of national policy in their relations with one another.”

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.”³⁰

Further treaties followed, specifying in greater detail the limits of what constituted (un)acceptable behavior in the context of armed conflict. As an example, 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.³¹

The horrors of the Second World War demonstrated the inadequacy of the existing rules, particularly in relation to the treatment of civilians and noncombatants. The four 1949 Geneva Conventions were concluded to address these issues,³² and these were strengthened by the Additional Protocols of 1977.³³ 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,³⁴ as well as the 1977 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), (16 I.L.M. 88) 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 importance of the obligations arising under the fundamental principles, particularly those contained in the Hague Conventions and the Geneva Conventions and their Additional Protocols, has been reaffirmed by the United Nations Security Council.³⁵ In addition, the establishment of various national, regional, and international enforcement

³⁰1899 Hague Convention II, [1907] Supp 1 *American Journal of International Law* 129.

³¹Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, xciv L.N.T.S (1929) 65–74.

³²Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field 75 U.N.T.S. 31, Geneva Convention for the Amelioration of the Condition of the Wounded, Sick and Shipwrecked Members of Armed Forces at Sea 75 U.N.T.S. 85, Geneva Convention Relative to the Treatment of Prisoners of War 75 U.N.T.S. 135 and Geneva Convention Relative to the Protection of Civilian Persons in Time of War 75 U.N.T.S. 287.

³³Protocol I Additional to the Geneva Conventions of August 12, 1949, and relating to the Protection of Victims of International Armed Conflicts (Additional Protocol I) 16 I.L.M. 1391 and Protocol II Additional to the Geneva Conventions of 12 August 1949 and relating to the Protection of Victims of Non-International Armed Conflicts 16 I.L.M. 1442.

³⁴These include the 1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (480 U.N.T.S. 43), the 1996 Comprehensive Nuclear Test-Ban Treaty (not yet in force) and the 1972 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction 1015 U.N.T.S. 163.

³⁵See, for example, United Nations Security Council Resolution 1674 on the Protection of civilians in armed conflict (2006), paragraph 6.

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 norms are to be brought to account.³⁶

While there are many principles that have arisen through the evolution of the *jus in bello*, it is perhaps pertinent to briefly mention 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 space³⁷:

- (a) The principle of distinction – deliberate attacks against civilians and noncombatants are prohibited.³⁸ In addition, those engaged in armed conflict must not use weapons that are incapable of distinguishing between combatants and noncombatants. 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.³⁹
- (b) The principle of military objective – 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.⁴⁰
- (c) The principle of proportionality – 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.

³⁶For a description of the powers and operation of the International Criminal Court see, Freeland S, “How Open Should the Door Be?: Declarations by non-States Parties under Article 12(3) of the Rome Statute of the International Criminal Court,” (2006) 75:2 *Nordic Journal of International Law* 211.

³⁷Many commentators combine issues of distinction and military objective into a broader principle known as “discrimination.” This author prefers to differentiate between these two issues so as to emphasize 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.

³⁸Article 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.”

³⁹In his dissenting opinion in *Legality of the Threat or Use of Nuclear Weapons*[1996] 1 ICJ Rep. 245, Judge Koroma pointed out (at page 577) 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.”

⁴⁰Article 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.”

This demands an assessment of any potential “collateral damage” in the case of military action. However, it is often difficult to apply the proportionality principle in practice, given that different people 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 the international law.⁴¹

6.5 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 and 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 consequence, 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 elsewhere, including on Earth.

Having reached this conclusion, it is then necessary to determine whether this is just an issue of academic curiosity or, alternately, that the rules of war are “relevant” to activities in outer space. The answer, unfortunately, appears self-evident.

As noted above, it was during the Gulf War in 1990 that the military value of space assets for the conduct of warfare was first utilized to a significant degree. Indeed, “Operation Desert Storm” is regarded as “the first space war” (Maogoto and Freeland 2007a). 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 US 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. Although the Obama administration has more recently issued an updated space policy that emphasizes cooperation to a far greater degree, these sentiments still represent the approach of the US military.

⁴¹On this issue the court was divided equally, with the casting vote of President Bedjaoui deciding the matter: see ICJ Statute, article 55(2).

Ballistic missiles play an increasingly important role in any sophisticated national security structure, and the development of defensive systems “is both a result of and additional factor driving” a global arms race (Hagen and Scheffran 2005). In 2001, prior to the attacks on September 11, a commission headed by former US Secretary of Defense, Donald Rumsfeld, suggested that an “attack on elements of U.S. space systems during a crisis or conflict should not be considered an improbable act” (Stoullig 2001). The report went on to (in)famously warn of the possibility of a “Space Pearl Harbor” – a surprise attack on the space assets of the United States.

The European Union has also identified outer space as “a key component for its European Defense and Security Policy” (Hagen and Scheffran 2005) and, as already noted, China and Russia also regard space as a vital part of their military infrastructure. 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 gone even further and opined that space warfare is, in fact, inevitable and cannot be avoided.⁴² 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.

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, describing it as a⁴³ (Final report to the prosecutor by the committee

⁴²See, for example, De Angelis (2002).

⁴³For a detailed analysis of the NATO Report, see Freeland (2002).

established to review the NATO bombing campaign against the Federal Republic of Yugoslavia, 13 June 2000 [2000a](#)):

very hardened and redundant command and control communications system [which . . .] uses commercial telephone, [...] military cable, [...] fibre optic cable, [...] high frequency radio communication, [...] microwave communication and everything can be interconnected. There are literally dozens, more than 100 radio relay sites around the country, and [...] everything is wired in through dual use. Most of the commercial system serves the military and the military system can be put to use for the commercial system.

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.” (Final report to the prosecutor by the committee established to review the NATO bombing campaign against the Federal Republic of Yugoslavia, 13 June 2000 [2000b](#)).

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.

Assume, for example, that a combatant regards a dual-use satellite – for example, 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 attack⁴⁴ (Henckaerts and Doswald-Beck [2005](#), p. 70).

⁴⁴There 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. Obviously, 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.⁴⁵

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 circumstances means that more specific rules will almost certainly be required, if they are to provide a comprehensive framework to properly protect humanity from the otherwise disastrous consequences of outer space (potentially) becoming another theatre of warfare.

6.6 Regulating the Threat of Space Warfare: Some Recent Initiatives

6.6.1 Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects (PPWT)

As noted above, 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. For example, in December 2007, the UNGA adopted another of these resolutions (United Nations General Assembly Resolution 62/20, 22 December 2007 on the “Prevention of an arms race in outer space”), having earlier repeated its invitation to member states to (United Nations General Assembly Resolution 62/43, 5 December 2007 on “Transparency and confidence-building measures in outer space activities”):

continue to submit . . . concrete proposals on international outer space transparency and confidence-building measures in the interest of maintaining international peace and security and promoting international cooperation and the prevention of an arms race in outer space

⁴⁵For a discussion of the difficulties of applying the proportionality principle in the case of the “high-altitude bombing” during the NATO military action in Serbia and Kosovo in 1999, see Freeland (2002).

Such measures focused even further the attention of the broader international community on the need to respond to various military initiatives taken by major space powers in their use of outer space. Moreover, the UNGA had, at the same time, also emphasized the importance of international cooperation in the peaceful uses of outer space, an important element of which is that (United Nations General Assembly Resolution 62/217, 22 December 2007 on “international cooperation in the peaceful uses of outer space”):

all States, in particular those with major space capabilities . . . contribute actively to the goal of preventing an arms race in 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.⁴⁶ The PPWT had been developed by Russia and China, two of the major space superpowers in the world. An earlier draft had been informally circulated the previous June, resulting in comments from a number of other countries.⁴⁷

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 presenting the PPWT, Minister Lavrov noted that the terms of the document were supported by a majority of the member states of the CD. He warned that⁴⁸:

[w]eapons deployment in space by one state will inevitably result in a chain reaction. And this in turn, is fraught with a new spiral in the arms race in space and on the earth.

In his supporting comments, the Foreign Minister of the People’s Republic of China, Yang Jiechi, added that (Message from Foreign Minister Yang Jiechi of The People’s Republic of China to the Conference of Disarmament, 12 February 2008):

[a] peaceful and tranquil outer space free from weaponization and [an] arms race serves the common interests of all countries. It is therefore necessary for the international community to formulate new legal instruments to strengthen the current legal regime on outer space.

In general terms, the PPWT focused on three primary obligations of state parties, each of which are specified in Article II:

- (a) 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”

⁴⁶The United Nations Conference on Disarmament was established in 1979 as the single multi-lateral disarmament negotiating forum of the international community, following the first Special Session on Disarmament (SSOD I) of the United Nations General Assembly held in 1978.

⁴⁷For example, Canada submitted “detailed comments” to Russia in relation to an earlier draft: Comments by Ambassador Grinius of Canada, Geneva, 12 February 2008, page 1.

⁴⁸Statement by H.E. Sergey Lavrov, Minister of Foreign Affairs of the Russian Federation at the Plenary Meeting of the Conference of Disarmament (unofficial translation), Geneva, 12 February 2008, page 6.

(b) Not to “resort to the threat or use of force against any outer space objects”

(c) Not to encourage another State(s) or intergovernmental organization to “participate in activities prohibited” by the PPWT

As well as applying to a broader range of weapons (see further below), the prohibitions in Article II, specifically Article II(b), rectify another major shortcoming of Article IV of the Outer Space Treaty, in that they appear to cover the *use* of such weapons as well as their placement.

In addition, the PPWT includes a definition of “outer space” as “space beyond the elevation of approximately 100 km above ocean level of the Earth” (Article I(a)). Apart from the curious use of the word “approximately” – in what circumstances would it *not* be 100 km? – this represents a rather revolutionary suggestion by two major superpowers, which, along with the United States, have historically tended to stifle attempts to designate a formal demarcation, primarily for strategic and political reasons.

As noted, one of the most important definitions in the PPWT is that of “weapons in outer space” (Article I(c)).⁴⁹ While it is a relatively broad description – including “any device” – it still leaves some room for doubt, particularly as to assets that may initially be “peaceful” but are subsequently utilized to “damage or disrupt normal functions of objects in outer space,” such as through the generation of various electromagnetic pulses. Moreover, if an object is deliberately allowed to become debris, and then affects the space assets of other States, query whether this falls within the requirement of “produced or converted.”

From a broader public international law perspective, the definitions of “use of force” and “threat of force” (Article I(d))⁵⁰ are of interest. Of course, as noted above, the concept of “force” is a fundamental principle of international law under both the United Nations Charter and by way of a customary norm (Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America) 1986), underpinning the conduct of international relations. Under traditional international law principles, “force” is regarded as an act of “violence,” so that, for example, economic sanctions were not to be regarded as such, despite arguments to the contrary raised by developing countries at the time that the United Nations Charter was being negotiated.

The definition in the PPWT appears to be considerably broader than these traditional views of what constitutes force, and was presumably drafted in this way to encompass (nonviolent) actions such as “jamming” and the use of

⁴⁹Article 1(c) of the PPWT provides that:

“the term ‘weapons in outer space’ means any device placed in outer space, based on any physical principle, specially produced or converted to eliminate, damage or disrupt normal function of objects in outer space, on the Earth or in its air, as well as to eliminate population, components of biosphere critical to human existence or inflict damage to them.”

⁵⁰Article 1(d) of the PPWT provides that:

“the ‘use of force’ or ‘threat of force’ mean any hostile actions against outer space objects including, inter alia, those aimed at their destruction, damage, temporarily or permanently injuring normal functioning, deliberate alteration of the parameters of their orbit, or the threat of these actions.”

electromagnetic interference, as long as they constituted a “hostile” act. Should this new approach to force become more widely accepted, it may also raise interesting questions about the legal nature of actions such as “cyber-attacks.”

In responding to the PPWT, the US 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 (Cumming-Bruce 2008). 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” (known colloquially as TCBMs) (Cumming-Bruce 2008).

Overall, 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 antisatellite capability.

At the time, the Chinese Communist Party newspaper, *The People’s Daily*, reported that (Randerson and Tran 2008):

[t]he United States, the world’s top space power, has often accused other countries of vigorously developing military space technology . . . But faced with the Chinese-Russian proposal to restrict space armaments, it runs in fear from what it claimed to love.

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. This has, in part, led to the development, primarily at the instigation of the European Union, of what is now known as the draft “International Code of Conduct for Outer Space Activities.”⁵¹

6.6.2 Draft International Code of Conduct for Outer Space Activities (CoC)

While it was not openly admitted, the rejection of the PPWT by the United States gave rise to added impetus for ways to find other avenues to progress discussions regarding the issues of space weaponization and space warfare. In late 2008, the

⁵¹The CoC had initially been referred to in discussions as the “European Union Code of Conduct for Outer Space Activities.”

Council of the European Union (EU) published a draft voluntary Code of Conduct for Outer Space Activities. This had been prepared by an EU Working Party on Global Disarmament and Arms Control, endorsed by the EU Political and Security Committee and submitted to the EU Council in December 2008. A revised draft of the CoC was adopted by the EU Council in September 2010. The document was intended to form the basis for consultations with third countries.

In adopting the draft CoC, the EU Council expressed its desire to (Council of the European Union 2010a):

strengthen [...] the security of activities in outer space in the context of expanding space activities that contribute to the development and security of states.

The draft CoC seeks to find a balance between a number of relevant (and sometimes competing) issues related to activities in outer space, particularly as they relate to a country's (real and perceived) national security interests. It is expressed to be guided by three underlying principles (Council of the European Union 2010b):

- (i) Freedom of access to space for peaceful purposes
- (ii) Preservation of the security and integrity of space objects in orbit
- (iii) Due consideration for the legitimate defense interests of States

It takes into account that (Council of the European Union 2010c):

space debris constitutes a threat to outer space activities and potentially limits the effective deployment and exploitation of associated space capabilities

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 space debris control and mitigation (specifically referred to in Article 5 of the CoC) and also by minimizing the possibility that a State would "destroy" another State's satellite (and in the process almost certainly create additional space debris). These are, of course, delicate issues related to the heart of space-related security, involving the need for close cooperation and agreement. In this regard, the CoC provides that the Subscribing States would (albeit on a voluntary basis) (Council of the European Union 2010d):

refrain from any action which intends to bring about, directly or indirectly, damage, or destruction, of outer space objects unless such action is conducted to reduce the creation of outer space debris and/or is justified by the inherent right of individual or collective self-defence in accordance with the United Nations Charter or imperative safety considerations

There has been some confusion and a series of mixed signals from the United States as to its approach to the CoC.⁵² On the one hand, from its perspective it is, in principle, a far more palatable "type" of instrument than the PPWT – a voluntary code as opposed to a binding treaty. Yet, to the extent that it is perceived

⁵²See, for example, Listner (2012)

as impinging upon America's "sovereignty," even this document has met with considerable and vehement opposition.⁵³

At a United Nations Institute for Disarmament Research (UNIDIR) conference in Geneva in April 2011, US Deputy Assistant Secretary, Bureau of Arms Control, Verification and Compliance in the Department of State, Frank Rose, indicated that (US Department of State 2011):

... the United States is continuing to consult with the European Union on its initiative to develop a comprehensive set of multilateral TCBMs, also known as the international "Code of Conduct for Outer Space Activities." We hope to make a decision in the near term as to whether the United States can sign on to this Code, including what, if any, modifications would be necessary.

In early January 2012, Ellen Tauscher, Undersecretary of State for Arms Control and International Security, stated that the US Government would not sign the CoC because it was "too restrictive" (Weisgerber 2012). Yet, only a few days later, Secretary of State Hillary Clinton indicated that (US Department of State 2012):

the United States has decided to join with the European Union and other nations to develop an International Code of Conduct for Outer Space Activities. A Code of Conduct will help maintain the long-term sustainability, safety, stability, and security of space by establishing guidelines for the responsible use of space ... [but] we will not enter into a code of conduct that in any way constrains our national security-related activities in space or our ability to protect the United States and our allies.

It is as yet still unclear as to whether and how this collaboration will be effected, let alone the end product, if any. It is not unreasonable to assume that the draft CoC as currently exists may form the basis of a starting point for further discussions, notwithstanding the objections of the American administration to its "restrictive" nature. However, there are clearly many unknowns in this respect, and it is by no means certain as to what specific terms would be included in any final document, let alone whether any agreement will be reached at all.

6.7 Conclusions: Perspectives on the Way Forward

This brief discussion gives rise to several conclusions: 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 may ultimately become a theatre of war. The tendency of the major powers to increasingly rely on space technology may spiral a space weapons race, despite the efforts of the international community. Even though the United States may currently claim space superiority, it can only be a matter of time before other spacefaring countries – including China and Russia – will have access to equally sophisticated (and potentially devastating) space weapons technology, if we have not already reached that point.

⁵³See, for example, Bolton and Yoo (2012)

Secondly, the development of such technology and the increasing range of military uses of outer space heighten the dangers of a space war, as frightening as that prospect is. 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, there are many uncertainties that arise when one seeks to apply, in particular, the laws of war to a (at this stage hypothetical) space conflict. The consequences of a space war are potentially so enormous and unknown that one cannot be sure as to exactly how these existing rules are to apply.

Fifthly, if we are to avoid "grey areas" in the law, it is therefore necessary to develop specific and clear rules and standards that categorically prohibit 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, does 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 appropriate,

relevant, and sufficient to protect humanity from the exigencies and consequences of any future “space wars.” Ideally, binding treaty norms should be negotiated, to be adhered to in good faith by all relevant States.

Having said this, to the extent that additional regulation may ultimately be concluded that (further) relates military/weapons-related activities in outer space, this is almost certainly not likely to take the form of binding treaty obligations that 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 non-binding basis. This illustrates the sensitivities related to (further) regulating outer space activities that (are perceived to) 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 stakeholders. Whether this outcome alone would be adequate to meet the complex issues remains a difficult question.

Finally and most significantly, in undertaking any future discussions and (possibly) developing new rules and norms, we must at all times adhere to the fundamental sentiment of “humanity” that underpins both space law and international humanitarian law, in order to avoid the possibility of alternate scenarios that are too frightening to contemplate.

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