

FROM NON-AGGRESSIVE MILITARY ACTIVITIES IN OUTER SPACE TO SPACE CONFLICTS

Insights into the lawfulness of current military activities in outer space, the applicability of IHL in the outer space context and State responsibility and individual criminal liability for environmental damage in outer space

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*Developments in space technologies and in particular satellites enable the facilitation of enhanced services such as telecommunication, Global Positioning Systems (GPS), weather forecasting and imagery, currently used for both civilian and military purposes. The growing reliance on space assets for military purposes resulted in a new space race, also typified by the development of defensive capabilities and the weaponisation of outer space, and with it in speculations on the prospect of armed conflict in outer space. Currently, there is a strong focus on the question whether International Humanitarian Law, considered the *lex specialis* of armed conflict, is applicable in outer space and if so, to what extent. The first part of this article engages with the question whether the militarisation and weaponisation of outer space are lawful. The second and third parts of this article question whether the rules and principles relevant to the protection of the environment during armed conflicts are applicable in outer space and if so, whether the Law of Armed Conflict can operate effectively in that context. The remainder of the article considers the issue of State responsibility for environmental damage in outer space and the applicability of Article 8(2)(b)(iv) of the Rome Statute of the International Criminal Court in the outer space context.*

Keywords: Space Law, OST, satellites, military activities, peaceful purposes, ASAT, IHL, armed conflicts, environment, space debris, State responsibility, Rome Statute, Article 8(2)(b)(iv)

If there is one general rule which can be deducted from the Balkan conflict and that of Operation Desert Storm, it is the following: ground superiority is contingent upon air superiority and that air superiority is now contingent upon space superiority

Michel Bourbonniere and Louis Haeck²

Introduction

While current military uses of outer space are generally limited to the deployment of satellites (both military and dual use), the utilisation of space technologies to further on-ground warfare (generally through the use of services enabling intelligence, communication and navigation) and the development of defensive capabilities to secure these assets³, the growth in the military uses of outer space and the strategic advantages of such uses raise concerns regarding the potential for

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² Michel Bourbonniere and Louis Haeck, 'Jus in bello spatialis' (1999, Space Studies Institute) 141.

³ Dale Stephens, 'The International Legal Implications of Military Space Operations: Examining the Interplay between International Humanitarian Law and Outer Space Legal Regime' (2018) 94 Int'l L. Stud 75, 76; Bill Boothby, 'Space Weapons and the Law' (2017) 93 Int'l L. Stud 179, 181.

armed conflicts in outer space.⁴ The number of participants in the space race is increasing. Emerging participants include the NATO States, Japan, New Zealand and Australia as well as India (which is now the fourth State to have tested an anti-satellite (ASAT) weapon⁵), Iran, and Israel.⁶ The number of space assets and military capabilities of the main space-active States (the U.S., Russia and China) has also developed substantially, with main developments occurring mainly in the areas of intelligence, surveillance, reconnaissance, communications, command and control.⁷ The U.S. Defense Intelligence Agency also suggests that China and Russia are currently developing means to counteract U.S. supremacy in outer space by exploiting its heavy reliance on space technology.⁸ Whether the use of force in outer space is likely to eventuate is a debated issue, however, not one that could be easily dismissed. As Freeland wrote:

*Unfortunately, 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 might ultimately be a theatre of war, despite the efforts of the international community. The proliferation of military space assets means that, from a 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.*⁹

The first part of this article engages with the question whether the militarisation and weaponisation of outer space are lawful. The second and third parts of the article question whether IHL rules and principles relevant to the protection of the environment during armed conflicts are applicable in outer space and if so, whether these rules and principles can operate effectively in that context. *Jus in bello* relevant to the protection of the environment shares a common interest with general discussion on the applicability of IHL due to two particular risks. The first is the potential increase in space debris (including nuclear power sources) and as a result the increase in the risk of collusion between fragments and space assets and the second is the possibility that space debris may fall onto land. The remainder of the article considers the issue of responsibility for environmental damage and the potential applicability of Article 8(2)(b)(iv) of the Rome Statute of the International Criminal Court to space conflicts. Article 8(2)(b)(iv) of the Rome Statute classifies the Intentional launching of an attack in the knowledge that such attack will cause *inter alia* widespread, long-term and severe damage to the natural environment that would be clearly excessive in relation to the concrete and direct overall military advantage anticipated, a war crime.

Are the militarisation and weaponisation of outer space lawful?

The hard law legal framework regulating human activities in outer space consists of five core treaties: the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use

⁴ Stephen Freeland, 'Peaceful Purposes? Governing the Military Uses of Outer Space' (Research Paper No. 03/2017 Legal Studies Research Paper Series, 2015, Western Sydney University School of Law) 49.

⁵ Sergio Marchisio, 'The final frontier: Prospects for arms control in outer space' (2019, European Leadership Network) 1.

⁶ Matthew T. King and Laurie R. Blank, 'Symposium on the New Space Race International Law and Security in Outer: Now and Tomorrow' (2019) 113 AJIL, 126.

⁷ *ibid* 126 - 127.

⁸ United States of America Defense Intelligence Agency, 'Challenges to Security in Space' (2019, United States of America Defense Intelligence Agency) 7.

⁹ Freeland (n 4) 49.

of Outer Space, Including the Moon and Other Celestial Bodies (the Outer Space Treaty or OST)¹⁰, which is the primary treaty regulating human activities in the outer space environment¹¹, the 1968 Agreement on the Rescue of Astronauts and the Return of Objects Launched in Outer Space (the Rescue Convention)¹², the 1972 Convention on International Liability for Damage Caused by Space Objects (the Liability Convention)¹³, the 1975 Convention on Registration of Objects Launched into Outer Space (the Registration Convention)¹⁴ and the 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (The Moon Agreement)¹⁵. A sixth treaty that is relevant to outer space is the Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer space and Underwater (the Limited Test Ban Treaty)¹⁶, which prohibits nuclear weapons tests in the atmosphere, in outer space and underwater.¹⁷

The legal regime regulating human activities in outer space is founded on the principles of common interest, peaceful use, freedom, no appropriation, co-operation, mutual assistance and non-intervention. The preamble to the OST recognises the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes. The principle of peaceful purposes is also codified in Article IV of the OST, which states that: *The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes*. Article I of the OST provides that the exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind and that outer space including the moon and other celestial bodies shall be free for exploration and use by all States without discrimination of any kind. Article II of the OST provides that outer space, including the Moon and other celestial bodies, is not subject to national appropriation by either a claim of sovereignty, means of use or occupation or by any other means. Article V also provides that astronauts shall be regarded as envoys of mankind in outer space.

Article IX of the OST reflects the principles of non-intervention, co-operations and mutual assistance. Article IX provides that State parties to the OST shall be guided by the principles of co-operation and mutual assistance in the exploration and use of outer space and conduct all their activities with due regard to the corresponding interests of all other State parties. Article IX further prescribes that State parties must conduct an appropriate international consultation where they have reason to believe that an activity or an experiment planned by them or their nationals would cause potentially harmful interference with the activities of other States in the peaceful exploration and use of outer space.

¹⁰ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

¹¹ Stephen (n 3) 86.

¹² Agreement on the Rescue of Astronauts and the Return of Objects Launched in Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue convention].

¹³ Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter Liability Convention].

¹⁴ Convention on Registration of Objects Launched into Outer Space, June 6 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention].

¹⁵ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 18, 1979, 1363 U.N.T.S. 3 [hereinafter Moon Agreement].

¹⁶ Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer space and Underwater, Aug. 5, 1963, 480 U.N.T.S. 43, entered into force Oct. 10, 1963 [hereinafter Limited Test Ban Treaty].

¹⁷ Limited Test Ban Treaty, Article I(1).

Are current military activities in outer space consistent with the principle of peaceful use?

Although the OST prescribes that outer space shall be used for 'peaceful purposes', the OST does not define the term, which leads to the question whether peaceful use means no military activities whatsoever or merely military activities that are non-aggressive. If the term 'peaceful purposes' as stated in Article IV of the OST is interpreted to mean 'no aggression', then the non-aggressive military use of outer space could be conceived as permissible. What State practice has demonstrated thus far is that it is now generally accepted that the term 'peaceful purposes' is interpreted to mean 'no aggression' and that certain military activities in space are permissible¹⁸, as evidenced by the current use of outer space for military activities.

Does the OST support the current interpretation of peaceful use? Article III of the OST imposes the obligation that states shall carry on activities in the exploration and use of outer space in accordance with International Law including the Charter of the United Nations¹⁹ in the interest of maintaining international peace and security and promoting international co-operation and understanding. There are two points of view as to whether the OST permits military activities. The first is that Article III of the OST contemplates peaceful uses only, as demonstrated by the specific reference to the Charter of the United Nations, which is also strengthened by the prohibitions imposed by Article IV of the OST.²⁰ Article 2(4) of the Charter of the United Nations reads as follows: *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*. Article 2(4) reflects the principal tenet of the United Nations to maintain international peace and security.²¹ Article IV of the OST prohibits the placing of nuclear weapons or any other weapons of mass destruction in outer space and the establishment of military bases, installations and fortifications, the testing of any kind of weapons and the conduct of military manoeuvres on the Moon and other celestial bodies. The second point of view is that although on its own Article III may suggest that the intention of the OST was that Space will be used for peaceful purposes only, when combined with Article IV, Article III could be interpreted to have contemplated that military activities that are consistent with the UN Charter and other International Law (that is, non-aggressive activities that do not involve the threat or use of force) are permissible as long as they do not breach the limitations imposed by Article IV of the OST.²² Whether the debate is still relevant bears its own uncertainties. It has been argued elsewhere that the debate whether the term 'peaceful purposes' means no military activities whatsoever or merely non aggression has become redundant since the militarisation of outer space is already a fact.²³ Considering, however, that in accordance with Article 31(3)(b) of the

¹⁸ Dale Stephens and Cassandra Steer, 'Conflicts in Space: International Humanitarian Law and its application to Space Warfare' (2015) XL Annals of Air and Space Law 1, 3.

¹⁹ Charter of the United Nations, entered into force 24 October, 1945, as amended by A/Res/1991 (XVIII) 17 December, 1963, entered into force 31 August, 1965, 557 U.N.T.S. 143, entered into force 12 June 1968, 638 U.N.T.S. 308 and 2847 (XXVI) of 20 December, 1971, entered into force 24 September, 1973, 892 U.N.O.TS 119. (hereinafter Charter of the United Nations)

²⁰ Freeland (n 4) 44-45.

²¹ Charter of the United Nations, Article 1.

²² Stephens (n 3) 80.

²³ *While there is general agreement – but not complete unanimity – among space law commentators that this is directed against 'non-military' rather than merely 'non-aggressive' activities, the reality has, unfortunately, been different. 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 –*

Vienna Convention on the Law of Treaties²⁴, any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation shall be taken into account in the interpretation of a treaty, State practice can continue to influence the interpretation of the term.²⁵

Is the weaponisation of outer space permissible?

Subject to certain limitations the weaponisation of outer space is not prohibited. Article IV of the OST imposes only two prohibitions that limit the weaponisation of outer space. The first is the prohibition on the placing of nuclear weapons or any other weapons of mass destruction in outer space and the second is the prohibition on the establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on the moon and other celestial bodies. The prohibition on the placing of nuclear/weapons of mass destruction in outer space reads as follows:

*States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.*²⁶

Technically, this means that the provision does not prohibit the deployment of conventional weapons, conventional weapons powered by a nuclear sources (not being weapons of mass destruction) nor the entry into space of weapons that transit through space (for example, Intercontinental Ballistic Missiles (ICBMs), weapons of mass destruction and nuclear weapons) since they do not complete a full orbit.²⁷ The precise wording of the prohibition on the establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on the moon and other celestial bodies is as follows:

*The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.*²⁸

The prohibition, therefore, is limited to: (1) the particular activities listed, being: the establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres, which means that military activities outside those specified are not necessarily prohibited, and (2) to the conduct of these activities on the Moon and other

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., Freeland (n 4) 45.

²⁴ Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S. 331.

²⁵ Freeland (n 4) 45.

²⁶ Outer Space Treaty, Article IV.

²⁷ Boothby (n 3) 202-203.

²⁸ Outer Space Treaty, Article IV.

celestial bodies only. The requirement that the Moon and other celestial bodies shall be used exclusively for peaceful purposes implies by its own wording that the term 'shall be used... exclusively for peaceful purposes' is also limited to the Moon and other celestial bodies, which in itself could be interpreted to mean that military activities around the Moon and other celestial bodies are permissible.

Does the Law of Armed Conflict extend to outer space?

The applicability of International Law in outer space is generally uncontested. Article III of the OST provides that State parties to the OST shall carry on activities in the exploration and use of outer space, including the Moon and other celestial bodies, in accordance with International Law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding. Whether the OST invites the applicability of IHL in particular, however, is a question of debate. On the one side it could be argued that although Article III of the OST does invite the applicability of International Law, the Article also makes clear reference to the Charter of the United Nations and the objects of peace, security, co-operation and understanding, which could reasonably be interpreted to mean that Article III extends to peacetime International Law only.²⁹ On the other hand it could be argued that since Article III of the OST provides that all activities in outer space shall be conducted in accordance with International Law, and since IHL is a body of law part of International Law, IHL is applicable.³⁰ If one takes the view that what is not expressly excluded is not necessarily precluded, it could be argued that since Article III does not expressly exclude the applicability of any specific body of International Law, conceptually, all relevant International Law, including IHL, could be considered applicable. If it is accepted that in principle IHL is applicable, the question then becomes which IHL rules and principles in particular could be considered relevant. To me, the most logical approach would be that providing that the military activities involved satisfy the threshold for use of force required to render the activities an armed conflict, unless a particular provision or principle is expressly excluded, IHL in its entirety should in as far as possible be considered applicable (although not without challenges) and should be implemented if and as each rule or principle becomes relevant. While some IHL rules may not appear relevant at this point in time, there is no knowing how the methods and means of space warfare may develop in the future, or for that matter what the future uses of outer space may be (including the possibility of human settlement). Considering the current interpretation of the term 'peaceful use' as non-aggressive, there is no knowing what the 'no appropriation' principle for example, or the prohibition on the establishment of military bases, installations and fortifications on celestial bodies may be interpreted to mean in the future. The focus, therefore, should be on understanding the relationship between IHL and Space Law and on resolving any conflicts of law that may arise. If, however, one had to argue the applicability of IHL relevant to the protection of the environment during space conflicts, support for the applicability the main instruments and customary principles could be derived from the treaties and principles themselves, the OST and the general principles of International Law.

²⁹ Kubo Mačák, 'Silent War: Applicability of the *Jus in Bello* to Military Space Operations' (2018), Exeter Centre for International Law Working Paper Series 2018/1, 14 <<https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1717&context=ils>> accessed 20 September 2019

³⁰ Freeland (n 4) 49.

The main treaty *jus in bello* relevant to the protection of the environment are the Hague Convention IV and its Hague Regulations³¹, the 1949 Geneva Convention IV³² and Additional Protocol I to the 1949 Geneva Conventions³³. Additional Protocol I embodies two out of the three provisions that afford protection to the environment in its own right. The first is Article 35(3), which prohibits the use of methods and means of warfare that are intended or may be expected to cause widespread, long-term and severe damage to the environment. Article 55(1) of Additional Protocol I, the second provision to offer direct protection, imposes *inter alia* a duty of care to protect the natural environment against widespread, long-term and severe damage.³⁴ It could, however, be argued that since the second part of Article 55(1) states that the protection mentioned includes a prohibition on the use of methods or means of warfare that are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population, the duty of care Article 55(1) applies only when the specified considerations are present. At the minimum, however, it could be argued that since Article 35(3) deals with the protection of the environment *per se* and does not entertain the contingencies of war (for example, military necessity) or any anthropocentric considerations and since the obligations imposed by the provision are owed to the environment itself, the applicability of Article 35(3) is not limited to the terrestrial environment and extends to outer space.³⁵ The second instrument to offer direct protection is ENMOD³⁶, which prohibits the use of environmental modification techniques having widespread, long-lasting or severe effects as means of destruction, damage or injury to another State party.³⁷ Environmental modification techniques refer to: *any technique for changing - through the deliberate manipulation of natural processes - the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space*.³⁸ Although whether ENMOD would become relevant in the context of space conflicts in the future is yet unknown, it does state its applicability.

The Geneva Conventions³⁹ also imply their applicability in the context of outer space. Common Article 1 to the Geneva Conventions states that the High Contracting Parties undertake to respect and to ensure respect for the conventions in all circumstances. It has been argued that the term 'in all circumstances' should be interpreted as extending the applicability of the Geneva Conventions to any armed conflict wherever it may occur, including outer space, as is also supported by the applicability of the Geneva Conventions to areas beyond national jurisdiction

³¹ Convention Respecting the Laws and Customs of War on Land and its annex Regulations concerning the Laws and Customs of War on Land, 18 October 1907, 36 Stat. 2277, 1 Bevans 631, 205 Consol. T.S. 277, 3 Martens Nouveau Recueil (ser. 3) 461, entered into force Jan. 26, 1910 [hereinafter Hague Convention IV and the Hague Regulations].

³² Geneva Convention Relative to the Protection of Civilian Persons in Time of War, Aug. 12, 1949, 75 U.N.T.S. 287 [hereinafter Geneva Convention IV].

³³ Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts, 8 June, 1977, 1125 U.N.T.S. 3 [hereinafter Additional Protocol I].

³⁴ Additional Protocol I, Article 55(1).

³⁵ Stephens and Steer (n 18) 9

³⁶ Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, Dec 10, 1976, 1108 U.N.T.S. 151 [hereinafter ENMOD].

³⁷ ENMOD, Article I.

³⁸ ENMOD, Article II.

³⁹ Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, Aug. 12, 1949, 75 U.N.T.S. 31 (hereinafter Geneva Convention I); Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, Aug. 12, 1949, 75 U.N.T.S. 85 (hereinafter Geneva Convention II); Geneva Convention Relative to the Treatment of Prisoners of War, Aug. 12, 1949, 75 U.N.T.S. 135 (hereinafter Geneva Convention III); Geneva Convention IV.

such as the high seas.⁴⁰ The applicability of the Hague Law in the outer space context has been subject to debate. It has been suggested that since the focus of the Hague Convention IV is on the law and customs of war on land, the convention does not demonstrate the intention that its application extends to the sea, air or outer space.⁴¹ Considering, however, that the Hague Convention is a document in respect of already existing Customary Law (as also reflected by its name: *Convention Respecting the Laws and Customs of War...*), the question to be asked is whether Customary Law could be considered applicable in outer space. It has been argued that since Customary International Law arises from *opinio juris* and State practice, unless the norm is established subject to specific limitation/s it cannot be considered to include such limitation/s and therefore, Customary International Law that regulates the conduct of the parties without distinction of the location where such conduct occurs, should not be taken to exclude outer space (or for that matter other novel domains such as cyberspace).⁴² The applicability of Customary International Law is also supported by the Martens Clause. The Martens Clause, a key IHL principle, provides *inter alia* that in the absence of treaty provisions, the parties to the conflict remain under the protection and rule of International Law as they arise from Customary International Law, the Laws of Humanity and the dictates of public conscience.⁴³ Other relevant Customary International Law are the grave breaches of the Geneva Conventions and Additional Protocol I and include: the extensive destruction and appropriation of property not justified by military necessity and carried out unlawfully and wantonly⁴⁴, launching an indiscriminate attack against civilian objects in the knowledge that such attack would cause excessive damage⁴⁵, attacks against works and installations containing dangerous forces⁴⁶, making non-defended localities and demilitarised zones the object of attack⁴⁷ and subject to conditions, making clearly-recognised historic monuments, works of art or places of worship that are afforded protection by special agreement the objects of attacks causing extensive destruction⁴⁸. Considering that some space assets are powered by nuclear sources, the prohibition on attacks on certain works and installations containing hazardous forces⁴⁹ may be relevant to attacks on nuclear powered space assets, however, the applicability of the prohibition is uncertain in view of the words 'works' and 'installations'. Considering the current militarisation and weaponisation of outer space (perhaps with the exception of the Moon and other celestial bodies) it is unlikely that at this point in time the area of space subject to human activities could be classified as a non-defended or demilitarised zone in accordance with Articles 59 and 60 of Additional Protocol I. Article IV of the OST could also be argued to import some of the rules regulating the use of certain weapons through the prohibition on the placing in orbit around Earth any objects carrying nuclear weapons or any kind of weapons of mass destruction, the installation of such weapons on celestial bodies

⁴⁰ Mačák (n 29) 20

⁴¹ *ibid* 20

⁴² *ibid* 22

⁴³ Hague Convention IV, Preamble; Additional Protocol I, Article 1(2); Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, Apr. 10, 1981, 1342 U.N.T.S. 137 (hereinafter Conventional Weapons Convention), Preamble.

⁴⁴ Geneva Convention I, Article 50; Geneva Convention II, Article 51; Geneva Convention IV, Article 147; Article 147 empowers Article 53 of the Geneva Convention IV, which prohibits the destruction of property where the destruction is not rendered absolutely necessary by military operations in the context of occupation.

⁴⁵ Additional Protocol I, Article 85(3)(b).

⁴⁶ Additional Protocol I, Article 85(3)(c).

⁴⁷ Additional Protocol I, Article 85(3)(d).

⁴⁸ Additional Protocol I, Articles 53 and 85(4)(d).

⁴⁹ Additional Protocol I, Article 56(1).

and the stationing of such weapons in outer space in any other manner, and in particular the Biological Weapons Convention⁵⁰ and the Chemical Weapons convention^{51, 52}

Is IHL suitable to govern in outer space?

A relevant question to the applicability of IHL is whether IHL, even if considered applicable, is suitable to govern in outer space. There are two aspects to this question. The first is whether IHL is sufficiently compatible to operate in an environment designated to peaceful use and the second is whether the rules and principles of IHL can effectively operate in the unique environment of outer space and in the context of high-tech methods and means of warfare that are likely to typify space conflicts.

The difference between Space Law and other peacetime regimes such as International Environmental, is that while International Environmental Law is a body of law that prescribes rules concerning the protection of the environment that could potentially be negotiated with or even incorporated into the Law of Armed Conflict, Space Law actually prescribes peaceful use. Considering that *jus in bello* does not prohibit armed conflicts, but rather, limits itself to regulating the conduct of the parties with the aim of reducing superfluous damage and unnecessary suffering⁵³, while accommodating the contingencies of war, inconsistencies or even conflict of law are likely to arise. This, however, does not mean that IHL can be excluded. Considering the current space race, unless Russia's Draft Treaty on the Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects (PPWT) is accepted (both the 2008 draft and the 2014 revised draft submitted to the Conference on Disarmament have been rejected⁵⁴) and the risk of use of force in outer space is considered insignificant, these inconsistencies need be addressed. It has also been argued that since the development of new treaties is unlikely, the most likely development in the law governing human activities in outer space is that of Customary Law.⁵⁵ While still early days, it is likely that the rules of engagement as established between the space-active states and State practice would play a role in shaping the foundations for further developments. While it is not disputed that the Law of Armed Conflict has not in itself yet developed so as to directly address the context of outer space and associated technologies (such as cyber warfare)⁵⁶ and there is much that would need to be determined by State practice, unless one is willing to accept that the faith of space would be even in the slightest directed by current military concerns (and potentially political considerations), the legal framework must be fully realised, not the least through the applicability of IHL. A useful approach to resolving any inconsistencies that exist between Space Law and *jus in bello* and that would potentially mitigate what could be described as the importation of lesser protections would be the interpretation of the Law of Armed Conflict, and in particular the rules relating to weaponry, according to the

⁵⁰ Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, 1972, 26 U.S.T. 583; T.I.A.S. 8062 (hereinafter Biological Weapons Convention).

⁵¹ Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on their Destruction, 1993, *reprinted in* 32 I.L.M. 804 (1993) (hereinafter Chemical Weapons Convention).

⁵² Boothby (n 3) 203.

⁵³ Hague Regulations, Article 23(e); Additional Protocol I, Article 35(2).

⁵⁴ Freeland (n 4) 50

⁵⁵ King and Blank (n 6) 129.

⁵⁶ Stephens (n 3) 97.

standards imposed under Space Law in as far as possible. Such approach would be consistent with similar recommendations for adapting the Law of Armed Conflict to contemporary circumstances, for example, Bothe's suggestion that the core IEL principles should be inserted in the application of IHL in order to address environmental concerns.⁵⁷

There is also a certain discomfort in the fact that outer space, or more precisely, services provided by space assets that are located in outer space (the use of which is designated for peaceful purposes) are used to support terrestrial warfare. The question, therefore, is not only whether IHL extends to outer space, but also whether Space Law should extend to the utilisation of non-aggressive activities for aggressive purposes. The active use of space technology to further on-ground warfare is now common place. The 1991 Gulf War, for example, was labelled a 'space war' due to the Coalition's material reliance on GPS services during Operation Desert Storm (with some 60 satellites used⁵⁸).⁵⁹ Other space-technology facilitated armed conflicts outside the 1991 Gulf War include NATO's operations in Yugoslavia in 1999 (which are considered to have been more heavily reliant on space technologies than the 1991 Gulf War)⁶⁰, the Coalition's actions in Afghanistan in 2001 and the invasion of Iraq in 2003.⁶¹ In environmental terms, the use of space technologies to support the implementation of military operations in the terrestrial environment means that the environmental damage caused by armed conflicts is likely to increase. Although the use of space technologies is likely to enhance precision and hence potentially reduce the level of collateral damage caused, at the same time the use of space technologies enables military operations that otherwise would not been possible, for example, navigation through clouds of smoke.

Challenges relating to the practical implementation of the rules and principles of IHL in outer space

The unique characteristics of space assets currently in use, the methods and means of warfare that are likely to be employed during space conflicts and the characteristics of outer space itself present unique challenges to the practical implementation of the rules and principles of IHL in the outer space context. The Law of Armed Conflict applies only when an armed conflict already exists, which means that the level of force used must be sufficient so as to render a military activity an armed conflict. Would the use of a single kinetic weapon (for example, an ASAT missile) to destroy a single satellite constitute sufficient use of force to trigger the applicability of the *jus in bello*? It is generally accepted that any use of force by one State against another (perhaps short of minor incidents⁶²) is sufficient use of force to trigger an international armed conflict since belligerent intent is an implied prerequisite for the existence of an international armed conflict.⁶³ The situation, however, is more nuanced in the case of non-international armed conflict. The minimum

⁵⁷ Michael Bothe, 'The Ethics, Principles and Objectives of Protection of the Environment in Times of Armed Conflict in war and the environment new approaches' in Rosemary Rayfuse (eds) *War and Environment: New Approaches to Protecting the Environment in Relation to Armed Conflict* (Brill, 2014) 105.

⁵⁸ Robert A. Ramey, 'Armed Conflict on the Final Frontier: the Law of War in Space' (2000) 48 A. F. L Rev, 1, 122.

⁵⁹ Dale Stephens 'Law and War in Outer Space' (Research Paper No. 18-03, 2018, Adelaide University Research Unit on Military Law and Ethics) 32.

⁶⁰ Ramey (above n 58) 122.

⁶¹ Stephen Freeland, 'Legal Regulation of the Military Use of Outer space - What Role for International Humanitarian Law?' (Bruges Colloquium Technological Challenges for the Humanitarian Legal Framework, Bruges, October 2010) 93.

⁶² ICRC, Commentary on the First Geneva Convention: Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, 2nd edition, 2016: Article 2: Application of the Convention [242].

⁶³ Nils Melzer, *International Humanitarian Law A Comprehensive Introduction* (ICRC, 2019) 56-57.

requirements for sufficient use of force in non-international armed conflicts are: (1) that the armed forces involved must be organised, and (2) that a minimum level of intensity must exist (which is higher than civil disturbances that require domestic policing action only).⁶⁴ This means that use of force by an actor not a member of an organised group would not satisfy the threshold. The use of 'soft-kill' methods (for example, electronic interference with the Satellite's communication systems or cyber attacks⁶⁵), may also presents difficulties. Considering that interference with a satellite could be executed through 'soft kill' methods, the question arises whether 'soft-kill' methods such as electronic interference for example, would be considered sufficient use of force. The Tallinn Manual⁶⁶ (although non-binding) offers some clarification in the context of cyber warfare, The view of the International Group of Experts is that any cyber operation that rises to the level of an armed attack in terms of scale and effects and is conducted by or otherwise attributable to a State, qualifies as a 'use of force threshold the given however, ,⁶⁷ of violence (and the degree of organisation of the armed groups) that is required for a non-international armed conflict, cyber operations in and of themselves will only amount to a non-international armed conflict in exceptional cases.⁶⁸ Whether this would apply to other 'soft kill' methods is also uncertain.

Distinguishing between military objectives and civilian objects may also prove particularly difficult in the context of outer space since space assets are generally used for both civilian and military purposes.⁶⁹ The dual use of space assets for civilian and military purposes also renders the implementation of the precautionary principle difficult. Article 57 of Additional Protocol I imposes *inter alia* the obligations that in the conduct of military operations constant care shall be taken to spare civilian objects⁷⁰ and that an attack be cancelled or suspended if it becomes apparent that the objective is not a military one.⁷¹ The main provision for the protection of the environment, Article 35(3) of Additional Protocol I, imposes a significantly high threshold capable of enabling even significant damage to escape the provision. If the cumulative requirement of 'widespread, long-term and severe 'damage is a problem on Earth, the vastness of outer space certainly magnifies this problem. The Principle of Proportionality suffers similar difficulties. The Principle of Proportionality prohibits damage that is excessive in relation to the military advantage sought by the military action.⁷² Considering that the outer limits of outer space are undefined, establishing the magnitude of damage may prove difficult. Foreseeability (and certainty) of the exact nature of the environmental damage that could be caused by a military action are also extremely difficult.⁷³ In terms of prevention, Rule 44 of the ICRC Study on Customary International Humanitarian Law⁷⁴ states that methods and means of warfare must be employed with due regard to the protection

⁶⁴ ICRC, 'Non-International Armed Conflict' (ICRC) <<https://casebook.icrc.org/glossary/non-international-armed-conflict>> accessed 20 September 2019.

⁶⁵ Luca del Monte, 'Understanding the Physics of Space Security' (Bruges Colloquium Technological Challenges for the Humanitarian Legal Framework, Bruges, October 2010) 85; Marchisio (n 5) 2.

⁶⁶ Michael Schmitt (ed.), Tallinn Manual 2.0 on the International Law Applicable to Cyber Warfare, Cambridge University Press, Cambridge, 2017 (hereinafter Tallinn Manual 2.0).

⁶⁷ Tallinn Manual 2.0, Commentary to Rule 69, 6.

⁶⁸ Tallinn Manual 2.0, Commentary to Rule 83, 2.

⁶⁹ Stephens and Steer (n 18) 18.

⁷⁰ Additional Protocol I, Article 57(1).

⁷¹ Additional Protocol I, Article 57(b).

⁷² Additional Protocol I, Articles 51(5)(b), 57(2)(a)(iii) and 57(b).

⁷³ King and Blank (n 6) 129.

⁷⁴ Jean-Marie Henckaerts, 'Study on customary international humanitarian law: A contribution to the understanding and respect for the rule of law in armed conflict' (2005) 87 *International Review of the Red Cross*, 857 [hereinafter ICRC Study on Customary International Humanitarian Law]

and preservation of the natural environment and that in the conduct of military operations all feasible precautions must be taken to avoid and in any event to minimise incidental damage to the environment. Considering the vastness of outer space and the state of limited scientific knowledge, it is difficult to appreciate what the appropriate measures would be. Can the above mentioned rules and principle be sufficiently adapted to operate in the outer space context? There is no reason why not since as discussed earlier, State practice is likely to play a significant role in the interpretation of the Law in the outer space context. This in itself is not a novel approach since the Law of Armed Conflict has often been said to be more widely drafted so as to enable its applicability in unanticipated circumstances. A safety net and an aspect capable of balancing any substantial distortions is the importance of space technology to the public at large, which means that not only space security is now a shared concern⁷⁵, but also that any damage to public and private infrastructure is likely to become subject to and hence further regulated by public scrutiny. Establishing a threshold for 'widespread', 'long-term' and 'severe' damage for the purpose of Article 35(3), however, may present greater difficulties (at least in the near future) for the simple reasons that the probability that any State would intentionally seek to risk its own assets, even if an attack would be launched by a non-space-active party, the current nature of space assets does not invite such extreme action, and unless the outer boundary of space would be delimited, the calculation of 'widespread, long-term and severe' damage is likely to remain indeterminate.

Responsibility for environmental damage and the applicability of Article 8(2)(b)(iv) of the Rome Statute in outer space

Currently, International Law (not withstanding regional instruments) does not impose criminal liability for environmental damage on States and the only obligation of the State causing the damage is to make reparations⁷⁶, whether the damage is caused by peaceful activities or is the result of an armed conflict. Peaceful activities in outer space (which according to current interpretation include the weaponisation of outer space in accordance with the limitations imposed by Article IV of the OST and other non-aggressive military activities) are governed by the rules and principles of Space Law. Article VII of the Outer Space Treaty provides that a State party that launches or procures the launching of an object into outer space and a State party from whose territory the object is launched, is internationally liable for damage that is caused by the object or its component parts to another State party (or its persons) either on Earth, in the air or in outer space. The Liability Convention imposes a stricter regime for damage caused by space objects, however, the stricter regime is limited to damage that is caused either on Earth or in the air. Article II of the Liability Convention states that the launching State shall be *absolutely* liable to pay compensation for damage that is caused by its space objects on the surface of Earth or to aircraft in flight, and therefore is a strict liability provision. Space objects are defined so as to include their component parts as well as their launch vehicles and parts thereof.⁷⁷ Pursuant to Article III of the Liability Convention, if the damage is caused to a space object (or persons or property on board) in a place other than on the surface of Earth, the State responsible is only liable if the damage occurred due to its fault or the fault of persons it is responsible for. The operation of the Liability Convention in the context of damage to space objects, however, has not yet been tested. While the opportunity to find under the Convention did arise in connection with the Soviet Union Cosmos 954 incident, the claim was settled with the payment of \$3,000,000.00

⁷⁵ Marchisio (n 5) 2.

⁷⁶ International Law Commission, Responsibility of States for Internationally Wrongful Acts, G.A. Res 56/83 annex, U.N. Doc. A/Res/56/83 (Dec. 12, 2001) Article 31(1).

⁷⁷ Liability Convention, Article 1(d).

(half the amount claimed by Canada).⁷⁸ The OST also imposes international responsibility under Article IX for breach of the principle of non-intervention. The first part of Article IX (which is the outmost environmental provision of the OST) states that:

...States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose.

The second part of Article IV imposes the duty of consultation where a State party has reason to believe that an activity or experiment that the State or its nationals plan to conduct in outer space would cause potentially harmful interference with activities of other State parties in the peaceful exploration and use of outer space. Consultation therefore must be conducted prior to proceeding with the planned activity or experiment. Thus far, the operation of Article IX of the OST was considered twice. The first instance was in relation to China's 2007 destruction of its own FY-1C weather satellite at an altitude of about 537 miles without prior consultation and the second was in relation to the United States' 2008 destruction of its own USA-193 satellite at an altitude of about 133 miles, which the U.S. claimed did not invoke State responsibility since the satellite fell into low orbit and its destruction was necessary⁷⁹.⁸⁰ It has been argued that had the U.S. recognised the applicability of Article IX and conducted consultation, States planning kinetic experiments would now come under scrutiny if they do not consult.⁸¹ Recognition of the applicability of Article IX would have also provided the opportunity for setting a standard for appropriate conduct for consultation as well as for setting a threshold for debris generation that would clarify when a State should have reason to believe that its planned activities would cause harmful interference.⁸² It has also been suggested that since both incidents resulted in space debris, which present risk to space assets and hence potential interference with peaceful activities, the fact that China was considered in breach and the U.S. intercept was defensible⁸³ suggests that the focus of the provision is on the knowledge that the activity will interfere with the peaceful use of outer space rather than on the interference itself⁸⁴, which sets a high threshold for 'potential harmful interference' that would inform the interpretation of the provision in armed conflicts.⁸⁵ Breaches of the Hague Convention IV, ENMOD, and the environmental provisions of Additional Protocol I also invoke State responsibility. It has been argued that even if reparations were strictly imposed, it is unlikely that the obligation to pay compensation would prove an effective enforcement mechanism since the likelihood that States would be willing to risk defeat is low.⁸⁶ Interestingly, a similar observation has been made in regard to Liability Convention. It has been argued that although the Liability Convention imposes State responsibility, it is unlikely that

⁷⁸ Ramey (above n 58) 91.

⁷⁹ Michael C. Mineiro, 'FY-1C and USA-193 ASAT Intercepts: An Assessment of Legal Obligations under Article IX of the Outer Space Treaty' (2008) 34 Journal of Space Law 321, 349.

⁸⁰ *ibid* 321-322.

⁸¹ *ibid* 353.

⁸² *ibid* 353.

⁸³ *ibid* 351-352.

⁸⁴ Stephens (n 3) 88.

⁸⁵ *ibid* 88.

⁸⁶ Michael N. Schmitt, 'Green War: An Assessment of the Environmental Law of International Armed Conflict' (1997) 22 YJIL 1, 91.

the responsibility imposed would affect the decision of a State to engage in the use of force in space or its choice of the means and methods employed.⁸⁷

A second challenge to State responsibility is the principle of no appropriation, which could pose difficulties in the practical implementation of a compensation system for environmental damage in a no territory environment. If space conflicts are a threat, then the enforcement mechanisms for the law that governs military activities that satisfy the definition of international armed conflicts in outer space must be strengthened in as far as possible. One of the considerations relevant to this situation is the question whether Article 8(2)(b)(iv) of the Rome Statute of the International Criminal Court⁸⁸ (ICC) is applicable in outer space. Pursuant to Article 5 of the Rome Statute, the ICC has jurisdiction to hear cases relating to the crime of genocide, crimes against humanity, war crimes and the crime of aggression. Pursuant to Article 5(c) of the Rome Statute, the ICC has jurisdiction to try war crimes for grave breaches of the 1949 Geneva Conventions and their 1977 Protocols and serious violations of the laws and customs applicable in international armed conflicts.

Indictments for war crimes, however, can be brought against individuals only⁸⁹, for example, the commander responsible for the commission of the crime or persons following orders.⁹⁰ The Rome Statute also offers limited remedies and does not include provisions that order recovery from individuals other than proceeds, property and assets that are derived from the crime itself.⁹¹ Nevertheless, despite these limitations, the threat of criminal prosecution is considered of high deterrent value.⁹² Article 8(2)(b)(iv) classifies as a war crime the:

Intentionally launching an attack in the knowledge that such an attack will cause incidental loss of life or injury to civilians or damage to civilian objects, or widespread, long-term and severe damage to the natural environment that would be clearly excessive in relation to the concrete and direct overall military advantage anticipated.

Article 8 of the Rome Statute lists other crimes that are relevant to the protection of the environment⁹³, however, these are predominantly anthropocentric and lend to the protection of the environment only to the extent of its role as part of the anthropocentric interest addressed.⁹⁴ Also noted is that Article 8 does not address nuclear, biological or chemical weapons. Articles

⁸⁷ Ramey (above n 58) 91.

⁸⁸ Rome Statute of the International Criminal Court, July 17 1998, 2187 U.N.T.S. 90 [hereinafter Rome Statute].

⁸⁹ Rome Statute, Article 25(1), (2) and (3)(a)-(d), (f).

⁹⁰ Rome Statute, Article 28 and 33(1); Individual criminal responsibility does not affect State responsibility and is in addition to State responsibility, Rome Statute, Article 25(4).

⁹¹ Rome Statute, Article 77(2)(b).

⁹² Kevin Jon Heller and Jessica C. Lawrence, 'The limits of Article 8(2)(B)(IV) of the Rome Statute, the first ecocentric environmental war crime' (2007) 20 GIELR 1, 12.

⁹³ Other War crimes relevant to the protection of the environment under the Rome Statute include: The extensive destruction and appropriation of property, not justified by military necessity and carried out unlawfully and wantonly (a grave breach), Article 8(2)(a)(iv); Intentionally directing attacks against civilian objects, Article 8(2)(b)(ii); Attacking or bombarding, by whatever means, towns, villages, dwellings or buildings which are undefended and which are not military objectives, Article 8(2)(b)(v); Destroying or seizing the enemy's property unless such destruction or seizure be imperatively demanded by the necessities of war, Article 8(2)(b)(xiii); Pillaging a town or place, even when taken by assault, Article 8(2)(b)(xvi); Employing poison or poisonous weapons, Article 8(2)(b)(xvii); Employing asphyxiating, poisonous or other gases, and all analogous liquids, materials or devices, Article 8(2)(b)(xviii).

⁹⁴ Mark A. Drumbl, 'Accountability for Property Crimes and Environmental War Crimes: Prosecution, Litigation, and Development' (2009, International Center for Transitional Justice Washington and Lee University) 8.

8(2)(b)(xvii) and (xviii) only refer to poison or poisoned weapons and poisonous or other gases and analogous liquids, materials or devices respectively.

Is Article 8(2)(b)(iv) of the Rome Statute applicable in outer space?

Conceptually, there is no reason why Article 8(2)(b)(iv) should not be considered applicable in outer space since neither Article 8(2)(b)(iv) nor the Rome Statute specifically exclude such applicability. The jurisdiction of the ICC to try war crimes, although subject to certain limitations and conditions, is universal⁹⁵, which in itself could be interpreted to mean that the jurisdiction of the Court is not subject to geographical limitations. Article 8(2)(b)(iv) does not make any reference to, nor imposes any conditions that expressly or impliedly exclude its applicability in outer space.

Is Article 8(2)(v)(iv) likely to be an effective mechanism in the context of outer space?

Although there is no apparent reason to exclude the applicability of Article 8(2)(b)(iv) in outer space and the provision is of high deterrent value, its effectiveness in the outer space context is likely to be hindered by the same factors that limit its effectiveness in the terrestrial environment, namely: barriers to access to the Court, the jurisdictional limitations of the ICC and the high thresholds that arise from the elements of the crime. An additional difficulty particular to the outer space context is the technical complexities of the methods and means of warfare that are likely to be employed during space conflicts (for example, electronic attacks, automated weapons and potentially even Artificial Intelligence Weapons Systems). The involvement of these advanced technologies would demand that judges and experts would have sufficient knowledge and understanding of the technologies involved.⁹⁶

To be heard, a case must be referred to the ICC by either a State party⁹⁷, the Security Council⁹⁸ or the prosecutor subject to the approval of the Pre-Trial Chamber.⁹⁹ Both the Geneva Convention IV and Additional Protocol I impose on States the obligation to prosecute or extradite individuals that commit grave breaches of these conventions¹⁰⁰, however, since Article 8(2)(b)(iv) is not listed under the heading 'Grave breaches', but rather is listed under the section for 'Other serious violations of the laws and customs...', States are under no formal obligation to do so. The only grave breach that relates to the environment is the breach of Article 53 of the Geneva Convention IV, which prohibits the extensive destruction and appropriation of property not justified by military necessity and carried out unlawfully¹⁰¹ and is listed in Article 8(2)(a)(iv) of the Rome Statute. Referrals by the Security Council require that the decision to refer the case must pass by a vote of nine of the fifteen members and that (other than on procedural matters) the nine votes must include the concurring votes of the permanent members, which are China, France, Russia, the U.S. and the UK and, which all have the power to veto the decision to refer the case to the

⁹⁵ Article 12(3) of the Rome Statute permits non-signatories to accept the jurisdiction of the ICC.

⁹⁶ Lindsay Freeman, 'Law in Conflict The technological transformation of war and its consequences for the International Criminal Court' (2019) JILP 807, 855

⁹⁷ Rome Statute, Article 13(a).

⁹⁸ Rome Statute, Article 13(b).

⁹⁹ Rome Statute, Article 13(c), 15(3) and (4).

¹⁰⁰ Geneva Convention IV, Article 146; Additional Protocol I, Article 85(1); Other provisions for voluntary referral: ENMOD, Article IV and the Biological Weapons Convention, Article IV.

¹⁰¹ Geneva Convention IV, Article 147.

Court.¹⁰² Considering that some of these countries are major participants in the militarisation and weaponisation of space, this may become a point of difficulty.

The jurisdiction of the ICC to hear cases relating to war crimes is also limited. The jurisdiction of the Court in relation to Article 8(2)(b)(iv) is conditional on the existence of an international armed conflict¹⁰³, as is also evident by the fact that Article 8(2)(b)(iv) is listed under the heading 'Other serious violations of the laws and customs applicable in international armed conflict, within the established framework of international law...'. The jurisdiction of the court is also limited to the most serious crimes of concern to the international community as whole¹⁰⁴, to war crimes that are committed as part of a plan or policy or as part of a large-scale commission of such crimes¹⁰⁵ and is also subject to State consent. Except for cases that are referred by the Security Council, for the Court to have jurisdiction, the State where the crime was committed or the State that the accused is a national of must accept the jurisdiction of the Court if the State concerned is not a signatory to the Rome Statute.¹⁰⁶ Since no State territory exists in space and registered space assets are only under the jurisdiction and control of the State¹⁰⁷, the reference to the State where the crime was committed is currently irrelevant. Pursuant to Article 12(2)(a) of the Rome Statute, however, the ICC may exercise jurisdiction over the State of registration if the crime was committed on board a vessel or aircraft. Whether this necessarily means that the ICC can exercise jurisdiction over the State of registration of a space asset on the basis that space is also a global common, however, is debatable.

An additional uncertainty that arises from the voluntary jurisdiction of the ICC is the question whether (providing that the case is not referred by the Security Council) the ICC has jurisdiction to hear a case in situations where the case is not referred by the Security Council and the relevant State is not a party to the Rome Statute and does not voluntarily accept the jurisdiction of the Court.¹⁰⁸ The ICC also does not have jurisdiction to hear a case where the case is being investigated or prosecuted by the State which has jurisdiction over the case unless the State is either unwilling or unable genuinely to carry out the investigation or prosecution¹⁰⁹, where the State decided not to prosecute the person concerned, unless the decision resulted from the unwillingness or inability of the State genuinely to prosecute¹¹⁰, where the person has already

¹⁰² Joe Sills, Jerome C. Glenn, Elizabeth Florescu and Theodore J. Gordon, 'Environmental Crimes in Military Actions and the International Criminal Court (ICC) - United Nations Perspective' (AEPI-IFP-0502A, 2001, Army Environmental Policy Institute) 11.

¹⁰³ Rome Statute, Article 5(1) and 8(2)(b)(iv).

¹⁰⁴ Rome Statute, Article 1.

¹⁰⁵ Rome Statute, Article 8(1).

¹⁰⁶ Rome Statute, Article 12(2).

¹⁰⁷ *A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object*, Outer Space Treaty, Article 8.

¹⁰⁸ Heller and Lawrence (n 92) 30

¹⁰⁹ Rome Statute, Article 17(1)(a); The Preamble to the Rome Statute also emphasises that that the International Criminal Court established under this Statute shall be complementary to national criminal jurisdictions.

¹¹⁰ Rome Statute, Article 17(1)(b); Article 17(2) of the Rome Statute states that: *In order to determine unwillingness in a particular case, the Court shall consider, having regard to the principles of due process recognized by international law, whether one or more of the following exist, as applicable: (a) The proceedings were or are being undertaken or the national decision was made for the purpose of shielding the person concerned from criminal responsibility for crimes within the jurisdiction of the Court referred to in Article 5; (b) There has been an unjustified delay in the proceedings which in the circumstances is inconsistent with an intent to bring the person concerned to justice; (c) The proceedings were not or are not being conducted independently or impartially, and they were or are being conducted in a manner which, in the circumstances, is inconsistent with an intent to bring the person concerned to justice.*

been tried by the relevant State¹¹¹, or where the case is not of sufficient gravity to justify further action by the Court¹¹². An additional issue is that Article 8(2)(e) of the Rome Statute on war crimes applicable in non-international armed conflicts does not list as a war crime the intentional launching of an attack in the knowledge that such an attack will cause incidental loss of life or injury to civilians or damage to civilian objects, or widespread, long-term and severe damage to the natural environment that would be clearly excessive in relation to the concrete and direct overall military advantage anticipated. Considering that most armed conflicts today are non-international¹¹³, this may become a point of difficulty if space assets would be utilised in non-international armed conflicts by a State, a non-State party or both. Whether armed groups involved in non-international armed conflicts have the capacity to do so or to cause widespread, long-term and severe environmental damage in outer space is uncertain, however, it must be borne in mind that some groups have already demonstrated technological capacities in utilising electronic means and in particular the internet and social media.¹¹⁴

The elements of the crime as stated in Article 8(2)(b)(iv) are: (1) intentionally launching an attack, (2) in the knowledge that the attack will cause widespread, long-term and severe damage to the natural environment, and (3) which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated. In order to satisfy these requirements it must be shown that the accused *knew* that the attack will result in widespread, long-term and severe environmental damage as well as that the widespread, long-term and severe damage would be clearly excessive in relation to the overall military advantage anticipated. Apart from the obvious difficulties involved in proving what the accused *knew* in order to successfully establish *mens rea*, showing that the attack was launched 'in the knowledge that the attack will result in widespread, long-term and severe damage. An additional complexity is that the Rome Statute does not define the terms 'widespread', 'long-term' and 'severe' damage, which means that not only it would be difficult to prove *mens rea*, *actus reus* is also uncertain.¹¹⁵ Considering that pursuant to Article 22(2) of the Rome Statute the definition of the crime must be strictly construed and in case of ambiguity the definition of the crime would be interpreted in favour of the person being investigated, prosecuted or convicted, the likelihood of succeeding in a claim on the basis of this requirement could be considered low.¹¹⁶ The provision also does not allow for negligence, wilful blindness or reckless behaviour.¹¹⁷ An additional complexity (which was already mentioned in the context of discussion on Article 35(3)) is the particular nature of the space assets currently in use. It is unlikely (at least for the time being) that the consequences of an attack on a one satellite (or even several satellites) would result in a degree of damage that would satisfy even a generous interpretation of 'widespread, long-term and severe' damage, particularly in an environment the outer boundaries of which are not delimited.

Conclusion

If there is anything that can be said with certainty it is that military activities in outer space are not likely to cease. Considering the importance of space assets in furthering on-ground warfare in

¹¹¹ Rome Statute, Article 17(1)(c).

¹¹² Rome Statute, Article 17(1)(d).

¹¹³ Drumbl (n 94) 9.

¹¹⁴ Freeman (n 96) 833.

¹¹⁵ Heller and Lawrence (n 92) 13.

¹¹⁶ *ibid* 13.

¹¹⁷ Drumbl (n 94) 9.

particular, the prospect of attacks on space assets cannot be dismissed. The OST, which is the main instrument regulating human activities in outer space, makes no reference to armed conflicts and therefore cannot in its current state be considered sufficient to regulate the use of force in outer space should space conflicts become a reality. Whether the Law of Armed Conflict extends to outer space, a zone designated for peaceful purposes, is subject to debate as is the suitability of this body of law to govern in this unique environment and in the technologically advanced context that is likely to typify space conflicts. Nevertheless, unless it is accepted that the faith of outer space must be influenced by current security concerns, a legal regime capable of effectively regulating the use of force in outer space must be developed. This could be done either through the inclusion of the rules necessary to effectively govern the use of force in the legal regime regulating human activities in outer space, or alternatively, by resolving any inconsistencies and conflicts of law that exists between IHL and Space Law. Given, however, that amendments to the hard law regime are considered unlikely, there is strong merit in developing a strong understanding of the relationship between IHL and Space Law, while at the same time encouraging dialogue contemplating international standards for thresholds of issue. Of main importance are thresholds for the use of force that consider contemporary methods and means of warfare, a clear threshold for the purpose of differentiating between civilian objects and military objectives in a dual use environment and a clear threshold for the purpose of the Principle of Proportionality that considers both the nature of space assets and the consequences of damage to these assets and the delimitation of outer space.

Considering the importance of space assets, it is not unreasonable to assume given sufficient risk security considerations would prevail (at least in the short term), which leads to the necessary conclusion that the enforcement mechanisms for the Law of Armed Conflict relevant to the protection of the environment must be strengthened so as to more effectively deter breaches. In its current state the legal regime prescribes State responsibility, which as has been recognised, is less than an optimal deterrent. Criminal liability for individuals responsible for environmental crimes, while of stronger deterrent power, is hindered by procedural and jurisdictional barriers that limit the number of cases heard as well as burdened by the high thresholds that arise from the elements of the crime itself, which are exacerbated in the outer space context. Of significant importance is the fact that the jurisdiction of the Court in relation to Article 8(2)(b)(iv) is limited to international armed conflicts. Considering that the most prevalent form of armed conflicts today is non-international and considering the possibility that such conflicts may extend to outer space in the future, there is strong merit in considering the extension of Article 8(2)(b)(iv) to non-state actors. This, however, would necessitate close attention to the requirement that the war crime must be part of a plan or policy or as part of a large-scale commission of such crimes.