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## Event Horizon: Examining Military and Weaponization Issues in Space by Utilizing the Outer Space Treaty and the Law of Armed Conflict

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**EVENT HORIZON: EXAMINING MILITARY AND  
WEAPONIZATION ISSUES IN SPACE BY UTILIZING  
THE OUTER SPACE TREATY AND THE LAW  
OF ARMED CONFLICT**

RYAN ESPARZA\*

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### ABSTRACT

This article takes the position that any lingering ambiguities surrounding the militarization and weaponization of outer space should be analyzed via the joint scope of the Outer Space Treaty and the Law of Armed Conflict. This article pulls key provisions from Additional Protocol I to the Geneva Conventions because of Additional Protocol I's application in international conflicts and affirmation of the four Geneva Conventions. After an examination of key Additional Protocol I provisions and their application to space, this article conducts a joint analysis of the Outer Space Treaty and the Law of Armed Conflict. This joint analysis examines three areas of militarization and weaponization in space: military personnel in space, anti-satellite weaponry, and national defense in space.

### INTRODUCTION

**A**T ONE POINT IN HISTORY, the militarization of space seemed to be little more than a fantasy. When the Soviet Union's satellite *Sputnik-1* successfully launched into outer space in 1957, the so-called "fantasy" became reality for many.<sup>1</sup> The space race was officially declared that day: both the United States and the Soviet Union were striving for advancement in space. However, that may not have been the only race declared that day. No longer was military action restricted to the ingrained models of land, sea, and air. Beginning in 1959, several proposals were presented which would bar the use of outer space for military purposes.<sup>2</sup> Ultimately, the first treaty to govern military action in outer space was the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies

<sup>1</sup> See Robert David Onley, *Death from Above? The Weaponization of Space and the Threat to International Humanitarian Law*, 78 J. AIR L. & COM. 739, 741 (2013).

<sup>2</sup> U.S. DEP'T OF STATE, TREATY ON PRINCIPLES GOVERNING THE ACTIVITIES OF STATES IN THE EXPLORATION AND USE OF OUTER SPACE, INCLUDING THE MOON AND OTHER CELESTIAL BODIES, <https://www.state.gov/t/isn/5181.htm> [https://perma.cc/979E-SJZ8].



(the Outer Space Treaty).<sup>3</sup> As mankind's presence and capabilities in space began to magnify, a number of international treaties were drafted and adopted to govern a State's actions in outer space and detail any liability deriving from such actions.<sup>4</sup> These treaties addressed militarization in space, limited the types of actions in which military personnel could engage, and proscribed the use of certain weaponry.

As mankind continues to seek the advancement of our capabilities in space, and as our technology continues to advance, new questions regarding military activity develop. The treaties governing outer space activities may have been able to dictate permissible actions to a point, but it would have been impossible to foresee the various advancements in military technology and strategy. However, this is not a failure on the part of the outer space treaties, because to determine what military action is permitted, it is necessary to read applicable provisions with the Law of Armed Conflict. The Law of Armed Conflict, namely the Geneva Conventions, applies automatically in most cases and is the core standard to which everyone is held in a conflict.<sup>5</sup> The Outer Space Treaty is the core standard for activities in space, and the Law of Armed Conflict builds upon the Treaty's restrictions. For this reason, when examining new and developing questions surrounding military action in space, it is necessary to examine the Outer Space Treaty and the Law of Armed Conflict together.

This article examines the application of the Outer Space Treaty and the Law of Armed Conflict on advancing issues of space militarization and weaponization. The article focuses on the scope of these two areas of international law and argues that the proper manner for examining emerging issues of militarization and weaponization in space is to utilize applicable articles of the Outer Space Treaty and the Law of Armed Conflict jointly. To properly demonstrate the joint application of the Outer Space Treaty and the Law of Armed Conflict, this note analyzes their application to (1) the presence of military personnel in outer space; (2) the use of anti-satellite weaponry; and (3) the application to national defense in outer space.

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<sup>3</sup> *See id.*

<sup>4</sup> *See generally* Emily Taft, *Outer Space: The Final Frontier or the Final Battlefield?*, 15 DUKE L. & TECH. REV. 362, 365–69 (2017).

<sup>5</sup> THOMAS BUERGENTHAL ET AL., INTERNATIONAL HUMAN RIGHTS IN A NUTSHELL 374–76 (2009).



## I. BACKGROUND

### A. TREATIES GOVERNING OUTER SPACE

The treaties that govern outer space activity consist of the before-mentioned Outer Space Treaty; the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the Rescue Agreement); the Convention on International Liability for Damage Caused by Space Objects (the Liability Convention); the Convention on Registration of Objects Launched into Outer Space (the Registration Convention); and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the Moon Treaty).<sup>6</sup>

The Outer Space Treaty requires parties to use the Moon and other celestial bodies for peaceful purposes.<sup>7</sup> In general terms, it prohibits placement of nuclear weapons or other weapons of mass destruction in orbit, on the Moon, or on other celestial bodies.<sup>8</sup> The treaty deters a State's ability to claim sovereignty over the Moon or celestial bodies.<sup>9</sup> Further, under the treaty, States are answerable for any damage caused by objects launched into space from their territory, bear responsibility for their activities in space, and are required to assist astronauts in distress.<sup>10</sup> In addition, any installations and vehicles in space shall be open, on a reciprocal basis, to representatives of other States, and all parties agree to conduct outer-space activities in accordance with international law.<sup>11</sup> This note will primarily focus on the Outer Space Treaty.

The Rescue Agreement requires "the safe return of astronauts and objects launched into space to their country of origin" on the request of the State.<sup>12</sup> The Liability Convention establishes processes for resolving "the liability of a state that damages or

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<sup>6</sup> See ROBERT RAMEY, *SPACE WARFARE AND THE FUTURE LAW OF WAR* 86–119 (1999).

<sup>7</sup> See generally *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, 610 U.N.T.S. 205 [hereinafter *Outer Space Treaty*].

<sup>8</sup> *Id.* art. IV.

<sup>9</sup> *Id.* art. II.

<sup>10</sup> *Id.* arts. V–VII.

<sup>11</sup> *Id.* art. XII.

<sup>12</sup> *International Legal Agreements Relevant to Space Weapons*, UNION OF CONCERNED SCIENTISTS (Feb. 11, 2004), <http://www.ucsusa.org/nuclear-weapons/space-weapons/international-legal-agreements> [<https://perma.cc/232E-RUVH>].

destroys space objects of another state[.]”<sup>13</sup> The Registration Convention requires “the registration of objects launched into space” with the United Nations.<sup>14</sup> The Moon Agreement provides that the Moon and other celestial bodies “should be used exclusively for peaceful purposes, that their environments should not be disrupted, and that the United Nations should be informed of the location and purpose of any station established on those bodies.”<sup>15</sup> Further, the Moon Agreement bans “any ownership of extraterrestrial property by any organization or private person, unless that organization is international and governmental.”<sup>16</sup> The primary issue with the Moon Agreement is that it is of little practical use since a large majority of States have not signed onto the agreement.<sup>17</sup>

## B. THE LAW OF ARMED CONFLICT

The first Geneva Convention, the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, encompasses treatment of wounded soldiers and medical personnel who are not actively taking part in hostility against a party.<sup>18</sup> The second Geneva Convention, the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, extends the protections within the first convention to naval forces and shipwrecked soldiers.<sup>19</sup> The third Geneva Convention, the Treatment of Prisoners of War, defines and dictates the treatment of prisoners of war.<sup>20</sup> Finally, the fourth Geneva Convention, the Protection of Civilian Persons in Time of War, grants civilians protection from inhumane treat-

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<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> Michael Listner, *The Moon Treaty: Failed International Law or Waiting in the Shadows?*, THE SPACE REV. (Oct. 24, 2011), <http://www.thespacereview.com/article/1954/1> [<https://perma.cc/GS8V-K49P>].

<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

<sup>18</sup> *See generally* 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.

<sup>19</sup> *See generally* 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.

<sup>20</sup> *See generally* Geneva Convention Relative to the Treatment of Prisoners of War, Aug. 12, 1949, 75 U.N.T.S. 135.

ment and attack, an extension of the protections granted to sick and wounded soldiers in the first convention.<sup>21</sup>

The Additional Protocols provide greater protections for international and non-international armed conflict.<sup>22</sup> Protocol I also expands the protections of civilians and combatants in international conflicts.<sup>23</sup> In addition, it extends protections to “medical facilities, cultural objects, places of worship, and resources relied on by the civilian population.”<sup>24</sup> Further, Additional Protocol I bans area bombardment, aerial bombardment which indiscriminately targets a large area, and requires command responsibility of superiors for the acts committed by their service members.<sup>25</sup>

Common Article III, present within all the Geneva Conventions, details the applicability of the remaining Geneva Convention articles to armed conflicts not of an international nature.<sup>26</sup> Protocol II develops the safeguards of Common Article III applicable to these conflicts.<sup>27</sup> Non-international armed conflicts were believed to consist of civil wars alone, but they have also come to be associated with terrorism.<sup>28</sup>

The Law of Armed Conflict contains two notable customary principles that limit the prosecution of war: *jus in bello* and *jus ad bellum*.<sup>29</sup> *Jus in bello* is the law that regulates “the conduct of States once armed conflict between them has begun.”<sup>30</sup> *Jus ad bellum* is the law governing a resort to armed conflict.<sup>31</sup> Put more simply, *jus in bello* disregards whether a conflict is lawful or unlawful, choosing instead to focus on the actions of the States in the conflict. *Jus ad bellum* focuses on whether the resort to the

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<sup>21</sup> See generally Geneva Convention Relative to the Protection of Civilian Persons in Time of War, Aug. 12, 1949, 75 U.N.T.S. 287.

<sup>22</sup> See Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), June 8, 1977, 1125 U.N.T.S. 3 [hereinafter Protocol I].

<sup>23</sup> See Erin Creegan, *Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Treatment of Terrorist Combatants (Protocol IV)—A Proposal*, 41 CAL. W. INT'L L.J. 345, 360–66 (2011).

<sup>24</sup> See *id.* at 361.

<sup>25</sup> *Id.* at 360–66.

<sup>26</sup> *Id.* at 364–65.

<sup>27</sup> *Id.* at 365.

<sup>28</sup> *Id.*

<sup>29</sup> Robert A. Ramey, *Armed Conflict on the Final Frontier: The Law of War in Space*, 48 A.F. L. REV. 1, 32 (2000).

<sup>30</sup> *Id.*

<sup>31</sup> *Id.*

use of force is justifiable. This note will primarily focus on Protocol I.

## II. THE LAW OF ARMED CONFLICT AND THE OUTER SPACE TREATY

The Law of Armed Conflict and the Outer Space Treaty contain uniform concepts. Due to the nature of their use, it may appear that the Law of Armed Conflict dictates actions on land and the Outer Space Treaty dictates actions in space. However, this could not be further from the truth. The proper way to examine an issue related to military action is by first examining the legal authority governing armed conflicts. The Law of Armed Conflict will always be the base point for an examination of whether a weapon or military action is permissible because it is designed to minimize suffering and prevent unnecessary destruction.<sup>32</sup>

The Outer Space Treaty is the law governing outer space, so it will be the first source of international law to consult in an analysis of permissible actions and objects in space. Where these actions and objects are military in nature, the next source of international law necessary for such an analysis is the Law of Armed Conflict. This is because it builds upon the Outer Space Treaty articles. Before it is possible to detail how the Law of Armed Conflict and the Outer Space Treaty work together, it is necessary to examine key concepts of both.

### A. FUNDAMENTAL PRINCIPLES

From *jus in bello*, three essential principles have emerged<sup>33</sup> that emphasize the conduct of “belligerents during warfare, thus forming a crucial part of the” Law of Armed Conflict.<sup>34</sup> These three principles consist of military necessity, distinction, and proportionality.<sup>35</sup> First, military necessity involves the reasonableness of the destruction of an enemy force.<sup>36</sup> Essentially, there

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<sup>32</sup> Ramey, *supra* note 29, at 28 (quoting Michael N. Schmitt, *Bellum Americanum: The U.S. View of Twenty-First-Century War and its Possible Implications of the Law of Armed Conflict*, in 71 INTERNATIONAL LAW STUDIES, THE LAW OF ARMED CONFLICT: INTO THE NEXT MILLENNIUM 412 (Michael N. Schmitt & Leslie C. Green, eds., 1998), reprinted in 19 MICH. J. INT’L L. 1051 (1998)).

<sup>33</sup> Jackson Maogoto & Steven Freeland, *The Final Frontier: The Laws of Armed Conflict and Space Warfare*, 23 CONN. J. INT’L L. 165, 176 (2007).

<sup>34</sup> See Ramey, *supra* note 29, at 35.

<sup>35</sup> Maogoto & Freeland, *supra* note 33, at 176.

<sup>36</sup> Maogoto & Freeland, *supra* note 33, at 176.



must be a specified military advantage gained by conducting an attack.<sup>37</sup> Further, military necessity calls for an apparent “connection between the attack and the suppression of the enemy’s military capability.”<sup>38</sup> Second, distinction requires an attacker to distinguish civilians and civilian objects from military combatants and objects and to use weaponry that is capable of making this distinction.<sup>39</sup> Simply, distinction requires “diligence in the ‘selection of methods, of weaponry, and of targets’” by a state who wishes to commence hostilities.<sup>40</sup>

Finally, proportionality demands an assessment of any probable collateral damage which may occur as a result of an attack.<sup>41</sup> In addition, even when an attack furthers a legitimate military objective, the results of the attack “should not be disproportionate to any expected military advantage.”<sup>42</sup> In order to determine what the results would be, it is necessary to examine the military force used and any injury or damage it inflicted upon civilians and civilian property.<sup>43</sup> These principles of necessity, distinction, and proportionality are reaffirmed in Protocol I.<sup>44</sup>

#### B. ADDITIONAL PROTOCOL I TO THE GENEVA CONVENTION

Protocol I to the Geneva Convention is the most relevant doctrine within the Law of Armed Conflict in terms of its application to space.<sup>45</sup> This is largely due to its wide applicability and limiting authority, which places restrictions on weaponry and military action.<sup>46</sup> Article 35 establishes the most fundamental rule of armed conflict, which is the right for parties to a conflict to select the means and methods of warfare.<sup>47</sup> However, this is not an unlimited authority: there are limitations on weapons, methods, materials, and projectiles that may cause gratuitous injury or unnecessary suffering.<sup>48</sup>

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<sup>37</sup> Maogoto & Freeland, *supra* note 33, at 176.

<sup>38</sup> Maogoto & Freeland, *supra* note 33, at 177.

<sup>39</sup> Maogoto & Freeland, *supra* note 33, at 177.

<sup>40</sup> Maogoto & Freeland, *supra* note 33, at 177 (quoting DOCUMENTS ON THE LAWS OF WAR 5 (Adam Roberts & Richard Guelff eds., 1989)).

<sup>41</sup> Maogoto & Freeland, *supra* note 33, at 178.

<sup>42</sup> Maogoto & Freeland, *supra* note 33, at 178.

<sup>43</sup> Maogoto & Freeland, *supra* note 33, at 178.

<sup>44</sup> Maogoto & Freeland, *supra* note 33, at 176–78.

<sup>45</sup> See Onley, *supra* note 1, at 754.

<sup>46</sup> See Onley, *supra* note 1, at 754.

<sup>47</sup> Protocol I, *supra* note 22, art. 35.

<sup>48</sup> Protocol I, *supra* note 22, art. 35.

Articles 48 and 52 work together to reinforce the second principle of *jus in bello*, distinction.<sup>49</sup> Article 48 establishes protections for the civilian population by distinguishing civilian objects from military objects and by limiting the operations of a State to military objectives.<sup>50</sup> Article 52 limits attacks to military objectives and defines military objectives as “those objects which by their nature, location, purpose or use make an effective contribution to military action.”<sup>51</sup> Further, there is a requirement that the “total or partial destruction, capture or neutralization,” offer a clear-cut military advantage of some kind.<sup>52</sup>

Article 51 establishes protections for civilian populations against military operations.<sup>53</sup> This Article seeks to regulate indiscriminate attacks on civilian populations.<sup>54</sup> The final Article from Protocol I which limits military action and weaponry in space is Article 56. Article 56 states that strategic sites which contain dangerous forces shall not be targeted for attack “if such attack may cause the release of dangerous forces and consequent severe losses among” civilians.<sup>55</sup> Ultimately, combatants must take precautions to spare civilians before the commencement of an attack. Section III addresses the precise applicability of the Law of Armed Conflict to the non-human-centric environment of space.

### C. LIMITATIONS FROM THE OUTER SPACE TREATY

Article IV of the Outer Space Treaty states that parties to the agreement shall not place into orbit, place on celestial bodies, or station in space in any manner objects carrying a nuclear weapon or other weapons of mass destruction.<sup>56</sup> In addition, Article IV requires that the Moon and other celestial bodies be used exclusively for peaceful purposes.<sup>57</sup> Military bases, installations, fortifications, the testing of any weapon, and military exercises are all forbidden on celestial bodies.<sup>58</sup> However, military personnel conducting research and the use of any equipment or

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<sup>49</sup> Protocol I, *supra* note 22, arts. 48, 52.

<sup>50</sup> Protocol I, *supra* note 22, art. 48.

<sup>51</sup> Protocol I, *supra* note 22, art. 52.

<sup>52</sup> Protocol I, *supra* note 22, art. 52.

<sup>53</sup> Protocol I, *supra* note 22, art. 51.

<sup>54</sup> Protocol I, *supra* note 22, art. 51.

<sup>55</sup> Protocol I, *supra* note 22, art. 56.

<sup>56</sup> Outer Space Treaty, *supra* note 7, art. 4.

<sup>57</sup> Outer Space Treaty, *supra* note 7, art. 4.

<sup>58</sup> Outer Space Treaty, *supra* note 7, art. 4.



facilities necessary for peaceful exploration of the Moon are permitted.<sup>59</sup> Article V details the treatment of astronauts in the event of “accident, distress, or emergency landing,” and requires the safe and prompt return of those astronauts to the State in which their space vehicle is registered.<sup>60</sup>

Article VI is relevant because it makes States responsible for the actions of non-governmental entities.<sup>61</sup> In the event that any non-governmental entity violates the treaty’s rules, it appears that States are ultimately responsible, incentivizing States to monitor the actions of such entities.<sup>62</sup> Article IX’s importance to weaponry and military actions derives from the requirement that if a State’s activity, experiment, or nationals could cause potentially harmful interference with another State’s peaceful exploration and use of space, then it must consult with that State before proceeding.<sup>63</sup> Likewise, if a State believes that another State’s activity or experiment will result in potentially harmful interference with its peaceful exploration and use of space, then it may request a consultation with the other State.<sup>64</sup>

### III. THE LAW OF ARMED CONFLICT AND THE OUTER SPACE TREATY

#### A. DOES THE LAW OF ARMED CONFLICT APPLY TO SPACE?

There may be a lingering question regarding why the Law of Armed Conflict applies in space—specifically why the Law of Armed Conflict applies when there is no appearance of a direct threat of harm to human beings. If there is weaponry in space intended for the benefit of a conflict, any action resulting from the use of that weapon will be subject to the Law of Armed Conflict. The Geneva Conventions establish that States shall comply and ensure compliance with the convention in all circumstances.<sup>65</sup> In addition, the International Court of Justice (ICJ) determined in an advisory opinion that the Law of Armed Conflict applied to “all forms of warfare and to all kinds of weapons,

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<sup>59</sup> Outer Space Treaty, *supra* note 7, art. 4.

<sup>60</sup> Outer Space Treaty, *supra* note 7, art. 5.

<sup>61</sup> Outer Space Treaty, *supra* note 7, art. 6.

<sup>62</sup> See Outer Space Treaty, *supra* note 7, art. 6.

<sup>63</sup> Outer Space Treaty, *supra* note 7, art. 9.

<sup>64</sup> Outer Space Treaty, *supra* note 7, art. 9.

<sup>65</sup> Dale Stephens, *Why Outer Space Matters: Dr. Dale Stephens Gives a Brief Introduction to International Humanitarian Law*, INT’L COMM. OF THE RED CROSS BLOG (Nov. 7, 2016), <http://intercrossblog.icrc.org/blog/twmzia1cp84kv2c29bi4iz6q4u03in> [<https://perma.cc/XRD8-JZYA>].

those of the past, those of the present and those of the future.”<sup>66</sup> This appears to establish that the arena in which combat may take place or the form it takes is irrelevant because the Law of Armed Conflict is applicable to any war and any weapon utilized. If this is the case, there is nothing limiting the application of the Law of Armed Conflict to space.

It seems that when there is a significant threat to human life by an attack, there is no question regarding the applicability of the Law of Armed Conflict. Ambiguity remains, however, regarding whether the law applies to a situation in outer space involving technology, namely satellites. This is a question that has lingered, and some have chosen to respond with the statement that “satellites don’t have mothers.”<sup>67</sup> This statement is just a reiteration of the idea that if there is not a direct threat to human life by an attack in space, then there is no need to protect or defend satellites in accordance with the Law of Armed Conflict.<sup>68</sup>

However, this is an inaccurate view of the Law of Armed Conflict. As previously noted, Articles 35, 48, 51, 52, and 56 of Protocol I are some of the most readily applicable provisions to space. This is due to their wide applicability to future anti-satellite weapons, which have the potential to precipitously cripple crucial noncombatant infrastructure.<sup>69</sup> Ultimately, this damage to infrastructure could harm civilian populations and therefore trigger the Law of Armed Conflict.

### 1. *Methods and Means of Warfare*

Article 35, which seeks to regulate superfluous injury or unnecessary suffering, should apply to an anti-satellite attack on an enemy’s satellite network that severely cripples the civilian population.<sup>70</sup> The results of such an attack would be the cessation of civilian communications.<sup>71</sup> In today’s society, rescue services, navigation on the ground and for aviation, cell phones, and

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<sup>66</sup> Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. Rep. 226, ¶ 86 (July 8).

<sup>67</sup> John J. Klein, *Space Warfare: Deterrence, Dissuasion and the Law of Armed Conflict*, WAR ON THE ROCKS (Aug. 30, 2016), <https://warontherocks.com/2016/08/space-warfare-deterrence-dissuasion-and-the-law-of-armed-conflict/> [https://perma.cc/KD7W-3CXC].

<sup>68</sup> *Id.*

<sup>69</sup> *Id.*

<sup>70</sup> See Protocol I, *supra* note 22, art. 35.

<sup>71</sup> See Onley, *supra* note 1, at 754–55.



many more services vital to infrastructure depend on satellite networks. Accordingly, such a widespread attack on a satellite network would affect the well-being of civilians.

Ultimately, this would adversely affect the civilian population because the infrastructure of a State would be crippled, potentially setting the State back decades during the restoration of its communications.<sup>72</sup> This would clearly be a case of unnecessary suffering, which Article 35 urges States to avoid, due to the immediate degradation of technological infrastructure.<sup>73</sup> The civilian population would be left without the technological infrastructure necessary to support modern civilian populations. The loss of infrastructure could result in the death of numerous individuals, a result Article 35 is intended to prevent.<sup>74</sup>

## 2. *Distinction*

Articles 48 and 52 represent the distinction portion of the *jus in bello* fundamental principles.<sup>75</sup> Both articles require combatants to distinguish between military objectives and civilian objects.<sup>76</sup> When it comes to satellites, distinguishing between civilian and military objectives can be difficult due to satellites' ability to serve both civilian and military purposes, sometimes simultaneously.<sup>77</sup> If the military uses satellites that also benefit civilians, those satellites may be viewed as valid military objectives. The goal of Articles 48 and 52 seems to be instilling responsibility for differentiating between objectives onto the State commencing the attack.<sup>78</sup> Collateral damage is allowed but must result from having lawfully targeted a military objective. This makes it more difficult for States to comply since force can only be lawfully directed at military objectives.<sup>79</sup> If a distinction between civilian and military objectives cannot be made, the State should avoid the attack completely.<sup>80</sup>

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<sup>72</sup> See Onley, *supra* note 1, at 755.

<sup>73</sup> See Protocol I, *supra* note 22, art. 35.

<sup>74</sup> See Protocol I, *supra* note 22, art. 35.

<sup>75</sup> See Protocol I, *supra* note 22, arts. 48, 52.

<sup>76</sup> Protocol I, *supra* note 22, arts. 48, 52.

<sup>77</sup> Onley, *supra* note 1, at 757.

<sup>78</sup> See Protocol I, *supra* note 22, arts. 48, 52.

<sup>79</sup> See Protocol I, *supra* note 22, art. 48.

<sup>80</sup> See Onley, *supra* note 1, at 757–58.

### 3. *Protection of Civilians*

Article 51 builds upon the distinction principle by requiring civilians to be protected from dangers that arise from military operations.<sup>81</sup> As mentioned previously, an attack on a State's satellite network could result in the collapse of civilian communications and overall infrastructure, which could lead to the loss of life. If an attack were to occur, the results would likely constitute a violation of Article 51.<sup>82</sup> Article 56 seeks to prevent attacks resulting in the release of dangerous forces or severe civilian losses.<sup>83</sup> Article 56 could be invoked as a preventative measure to the destruction of a satellite.<sup>84</sup> This is due to the debris released from such an attack, which could potentially damage other nearby satellites. This would cause—or possibly exacerbate—some of the issues already mentioned that would result from the destruction of satellites. In addition, while it is likely that debris would stay in orbit or burn up on re-entry, it is possible that debris from an attack could reach Earth's surface.<sup>85</sup> Besides the possibility that this debris could cause direct harm by landing in a heavily populated area, harm could result from the fact that some materials used in the construction of satellites—like hydrazine, which can produce effects similar to that of a neurotoxin—are severely toxic and could cause adverse effects on the civilian population.<sup>86</sup>

#### B. HOW THE LAW OF ARMED CONFLICT AND THE OUTER SPACE TREATY WORK JOINTLY

It appears that the Law of Armed Conflict is, in fact, applicable in outer space, both in situations where there is a direct threat to civilian populations and in situations where the threat is not so apparent. While the Outer Space Treaty does make some progress in addressing potential military or weaponization issues in space, there are some issues that it leaves open. For example, the Outer Space Treaty only limits the use of weapons

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<sup>81</sup> See Protocol I, *supra* note 22, art. 51.

<sup>82</sup> See Protocol I, *supra* note 22, art. 51.

<sup>83</sup> Protocol I, *supra* note 22, art. 56.

<sup>84</sup> See Protocol I, *supra* note 22, art. 56.

<sup>85</sup> Onley, *supra* note 1, at 760.

<sup>86</sup> Onley, *supra* note 1, at 760.; see also ENVTL. PROT. AGENCY, *Health Effects Notebook for Hazardous Air Pollutants*, Hydrazine CAS 302-01-2, <https://www.epa.gov/sites/production/files/2016-09/documents/hydrazine.pdf> [<https://perma.cc/5KJC-AGWX>].

of mass destruction, not the use of all weapons.<sup>87</sup> There is nothing within the Outer Space Treaty which restricts a State from stationing another type of weapon in space.<sup>88</sup> Further, there is great debate over the exact meaning of “peaceful purposes” under the Outer Space Treaty.<sup>89</sup> Some interpret it to mean “non-military” while others interpret it to mean “non-aggressive” or “non-hostile.”<sup>90</sup>

The problem with the Outer Space Treaty is that there are various loopholes that any State may utilize. While some restrictions the Outer Space Treaty places on States are finite, others change depending on whether the State’s action occurs on a celestial body or in space. However, the Law of Armed Conflict can help fill some of the void left by the Outer Space Treaty.

The Law of Armed Conflict is largely considered to be customary international law, like the articles set forth in the Outer Space Treaty.<sup>91</sup> Customary international law is an obligation that arises from States’ practices.<sup>92</sup> Essentially, when enough States engage in a practice, it becomes the standard upon which all States are held.<sup>93</sup> This means that even if States are not parties to the Outer Space Treaty or agreements that derive from the Law of Armed Conflict, they are still bound to follow these international laws.<sup>94</sup> Even if a State withdraws and decides to enact a law counter to the Outer Space Treaty or the Law of Armed Conflict, it would still be bound to these agreements due to their status as customary international law.<sup>95</sup>

Article III of the Outer Space Treaty states that parties to the treaty shall operate their activities in the exploration and use of space in accordance with applicable international law.<sup>96</sup> The

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<sup>87</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>88</sup> See Outer Space Treaty, *supra* note 7, arts. I–XVII.

<sup>89</sup> See Outer Space Treaty, *supra* note 7, art. IV; Onley, *supra* note 1, at 751 (quoting John W. Bellflower, *The Influence of Law on Command of Space*, 65 A.F. L. REV. 107, 128 (2010)).

<sup>90</sup> Onley, *supra* note 1, at 751.

<sup>91</sup> Onley, *supra* note 1, at 751 (citing David A. Koplow, *ASAT-ism: Customary International Law and the Regulation of Anti-Satellite Weapons*, 30 MICH. J. INT’L L. 1187, 1233–35 (2009)).

<sup>92</sup> For a more thorough discussion, see *Military and Paramilitary Activities in and Against Nicaragua* (Nicar. v. U.S.), Judgment, 1986 I.C.J. 14, 181 (June 27); see also *North Sea Continental Shelf* (Fed. Repub. Ger. v. Den. & Neth.), 1969 I.C.J. 3 (Feb. 28).

<sup>93</sup> Koplow, *supra* note 91, at 1223.

<sup>94</sup> Koplow, *supra* note 91, at 1229.

<sup>95</sup> See Koplow, *supra* note 91, at 1229.

<sup>96</sup> Outer Space Treaty, *supra* note 7, art. III.

purpose behind this guideline derives from two ideas: (1) to ensure the maintenance of international peace and security; and (2) to promote international operations and understanding.<sup>97</sup> This indicates that the Outer Space Treaty is not meant to be interpreted on its own. Instead, it is necessary to examine issues that manifest under the Outer Space Treaty in combination with any other applicable international law. Therefore, the Outer Space Treaty must be used in combination with the Law of Armed Conflict to accurately examine any issues involving militarization or weaponry in space.

#### IV. MILITARY ACTION AND THE WEAPONIZATION OF SPACE

The most beneficial way to examine issues that originate from the utilization of space is by first examining whether the Outer Space Treaty explicitly prohibits the action, method, or weapon in question. If it is not prohibited by the Outer Space Treaty, then it is necessary to examine any prohibition which may develop due to the Law of Armed Conflict. Since the Law of Armed Conflict is so far-reaching, if an action, method, or weapon clears any hurdles raised by the Law of Armed Conflict, it is likely that that action, method, or weapon is not prohibited.

##### A. MILITARY PERSONNEL IN SPACE

###### 1. *Military Bases and Military Installations*

The Outer Space Treaty expressly forbids constructing military bases, installations, and fortifications on celestial bodies.<sup>98</sup> However, the use of “any . . . facility necessary for the peaceful exploration of the moon and other celestial bodies” is permitted.<sup>99</sup> This clearly leaves room for military installations to be placed in space. Theoretically, if a state were to construct military bases, installations, or fortifications in outer space, that action would appear valid under the Outer Space Treaty. There is no apparent harm from the construction, so it is unlikely that the Law of Armed Conflict would be triggered, and it would appear that such an installation is permissible.

However, while the Outer Space Treaty allows for the construction of any facilities used for peaceful explorations of the

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<sup>97</sup> Outer Space Treaty, *supra* note 7, art. III.

<sup>98</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>99</sup> Outer Space Treaty, *supra* note 7, art. IV.



Moon and other celestial bodies, what these facilities may consist of is not defined.<sup>100</sup> Thus, if a military base conformed with the peaceful purpose of the Outer Space Treaty and was necessary for peaceful exploration, it would appear to be permissible. If the drafters wanted to use the term “military base” in place of “facility” they could have repeated the “military bases, installations and fortifications” language used earlier in the treaty.<sup>101</sup> Instead, the term “facility” is used here, and a distinction is made for military personnel engaging in scientific research. Therefore, the facility mentioned in Article IV must mean a facility that is not a military base, installation, or fortification.

Further justification for this interpretation is apparent when examining Article IV. Military personnel performing scientific research is explicitly mentioned.<sup>102</sup> These individuals are not prohibited from operating in outer space.<sup>103</sup> This seems to indicate that there is something different about military bases, installations, and fortifications. Under the Outer Space Treaty, it appears that in all circumstances these facilities are forbidden from celestial bodies.<sup>104</sup> However, floating a military base or installation in outer space seems permissible under the Outer Space Treaty.

## 2. *Reconnaissance*

There is no language within the Outer Space Treaty that expressly forbids reconnaissance. Similarly, as with military bases and installations in space, reconnaissance activities cause no apparent harm, so it is unlikely that the Law of Armed Conflict would be triggered.<sup>105</sup> Article I of the Outer Space Treaty explicitly states that “[o]uter space, including the moon and celestial bodies shall be free for exploration and use by all States.”<sup>106</sup> Further, the ambiguity surrounding the meaning of “peaceful purposes” leaves room for interpretation.

As mentioned earlier, some scholars interpret “peaceful purposes” to mean “non-military” while others interpret it to mean “non-aggressive” or “non-hostile.”<sup>107</sup> There has largely not been

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<sup>100</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>101</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>102</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>103</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>104</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>105</sup> See Outer Space Treaty, *supra* note 7, art. IV.

<sup>106</sup> Outer Space Treaty, *supra* note 7, art. I.

<sup>107</sup> See *supra* notes 89–90 and accompanying text.

protest for overflights of satellites performing reconnaissance.<sup>108</sup> There are restrictions when reconnaissance requires crossing into a State's sovereign airspace, but reconnaissance from space seems permissible.<sup>109</sup> Space-based reconnaissance conforms with the requirements set forth in the Outer Space Treaty, and there is no apparent restriction.<sup>110</sup>

## B. ANTI-SATELLITE TECHNOLOGY

A significant portion of attacks using anti-satellite technology involve some form of interference. The International Telecommunication Union (ITU) coordinates frequency assignments and regulates orbital slots for satellites.<sup>111</sup> The benefits of becoming a member of the ITU include international recognition of space-based frequency assignments and the ability to protect satellite networks from harmful interference.<sup>112</sup> The ITU Constitution, which member states agree to act in accordance with, explicitly addresses harmful interference in Article 45.<sup>113</sup> Article 45 requires the avoidance of harmful interference by member States and requests that States take practicable steps to ensure that harmful interference does not occur on their behalf.<sup>114</sup> Similar principles are also codified in the ITU Convention and the ITU Radio Regulations.<sup>115</sup>

The Radiocommunication Bureau (the Bureau) and Radio Regulations Board (the Board) interpret, administer, and en-

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<sup>108</sup> Joseph R. Soraghan, *Reconnaissance Satellites: Legal Characterization and Possible Utilization for Peacekeeping*, 13 MCGILL L.J. 458, 458 (1967).

<sup>109</sup> *See id.* at 459–60.

<sup>110</sup> *See* David L. Willson, *An Army View of Neutrality in Space: Legal Options for Space Negation*, 50 A.F. L. REV. 175, 177 n.2 (2001) (defining interference).

<sup>111</sup> Jannat C. Thompson, *Space for Rent: The International Telecommunications Union, Space Law, and Orbit/Spectrum Leasing*, 62 J. AIR L. & COM. 279, 289–90 (1996).

<sup>112</sup> Julie N. Zoller, *Satellite Regulations*, INT'L TELECOMM. UNION, [http://www.itu.int/net/newsroom/wrc/2012/features/satellite\\_regulations.aspx](http://www.itu.int/net/newsroom/wrc/2012/features/satellite_regulations.aspx) [<https://perma.cc/KX9A-3KSG>].

<sup>113</sup> Constitution of the International Telecommunication Union (Geneva, 1992), art. 45, 1996 B.T.S. 24 [hereinafter ITU Constitution].

<sup>114</sup> *Id.*

<sup>115</sup> *See* Convention of the International Telecommunication Union, Collection of the Basic Texts Adopted by the Plenipotentiary Conference, at 95, 103–04 (2015) [hereinafter ITU Convention]; *see also* Radio Regulations of the International Telecommunication Union, art. 15 (2016) [hereinafter ITU Radio Regulations].

force the policies and agreements of the ITU.<sup>116</sup> The Bureau applies the provisions of the Radio Regulations and Rules of Procedure.<sup>117</sup> It also investigates and assists in resolving cases of harmful interference.<sup>118</sup> The Board addresses matters that the Bureau cannot resolve by applying the Radio Regulations and provides recommendations on reports of unresolved interference investigations carried out by the Bureau.<sup>119</sup> However, there are several issues with the ITU that prevent it from being as helpful as the Outer Space Treaty and the Law of Armed Conflict. One detrimental difference when compared to the Outer Space Treaty and the Law of Armed Conflict is that the ITU is not considered to be customary international law. States have broken the ITU Convention, Constitution, and Radio Regulations on several occasions.<sup>120</sup> If States are acting counter to the rules set in place, it becomes difficult to say that there is any chance that those rules will achieve customary international law status. States join the ITU because it is in their best interest, but the observance of the rules is based more on an honor system because the ITU has no enforcement power.<sup>121</sup> The ITU cannot exercise any real control over member States, which ultimately makes its use less practical than the Outer Space Treaty or the Law of Armed Conflict. For these reasons, the following analysis will not take the ITU into consideration.

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<sup>116</sup> The Radiocommunication Bureau and the Radio Regulations Board were formerly a joint division of the ITU called the International Frequency Registration Bureau (IFRB). See Thompson, *supra* note 111, at 289 n.76.

<sup>117</sup> *Radio Regulations Board (RRB)*, INT'L TELECOMM. UNION, <https://www.itu.int/en/ITU-R/conferences/RRB/Pages/default.aspx> [https://perma.cc/YA38-ZXCK].

<sup>118</sup> *Id.*

<sup>119</sup> *Id.*

<sup>120</sup> See Peter B. de Selding, *Eutelsat Blames Ethiopia as Jamming Incidents Triple*, SPACE NEWS (June 6, 2014), <http://spacenews.com/40818eutelsat-blames-ethiopia-as-jamming-incidents-triple/> [https://perma.cc/237X-AWEU]; see also Stephanie Nebehay, *U.N. Tells Iran to End Eutelsat Satellite Jamming*, REUTERS (Mar. 26, 2010, 7:23 AM), <https://www.reuters.com/article/us-iran-jamming-itu/u-n-tells-iran-to-end-eutelsat-satellite-jamming-idUSTRE62P21G20100326> [https://perma.cc/G6DD-CZW4].

<sup>121</sup> Thompson, *supra* note 111, at 290.

### 1. *Jamming*

Jamming is the overloading of enemy receivers with strong signals sent via another satellite or an uplink station.<sup>122</sup> Jamming targets typically consist of positioning systems, navigation systems, and satellite communications.<sup>123</sup> It is possible to defeat jamming attempts via encryption.<sup>124</sup> For example, military communication is likely to be heavily encrypted and therefore unlikely to be subject to successful jamming attempts.<sup>125</sup> Thus, jamming has a greater potential to impact civilians.

If a jamming attack comes from another satellite, it is necessary to examine the Outer Space Treaty to determine whether there is some trigger for its application. The Outer Space Treaty forbids weapons of mass destruction.<sup>126</sup> Jamming is not forbidden by this portion of Article IV because it is not a weapon of mass destruction. The Moon and celestial bodies have to be used exclusively for peaceful purposes, but satellites are stationed in space and therefore do not trigger this section of the article. To this point, it appears that Article IV does not apply to satellite-on-satellite jamming.

However, Article IX may be applicable because it requires States to undertake appropriate consultations with another State if they believe an activity or experiment planned in outer space could cause potentially harmful interference with activities of another State in its peaceful exploration and use of outer space.<sup>127</sup> This article appears to require a State engaging in jamming to first consult the State subject to jamming.<sup>128</sup> The issue with resolving a jamming issue—or any space issue—under Article IX, is that the article appears only to apply during peaceful exploration.<sup>129</sup> Traditionally it has been up to States to determine when consultation is necessary, and because jamming is not peaceful, it is unlikely a State would engage in such a consul-

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<sup>122</sup> See U.S. CONGRESS, OFFICE OF TECH. ASSESSMENT, ANTI-SATELLITE WEAPONS, COUNTERMEASURES, AND ARMS CONTROL 4 (1985), <https://www.princeton.edu/~ota/disk2/1985/8502/8502.pdf> [<https://perma.cc/UH5P-4Z6H>].

<sup>123</sup> See Bill Boothby, *Space Weapons and the Law*, 93 INT'L L. STUD. 179, 210 (2017).

<sup>124</sup> *Id.*

<sup>125</sup> *Id.*

<sup>126</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>127</sup> Outer Space Treaty, *supra* note 7, art. IX.

<sup>128</sup> See Outer Space Treaty, *supra* note 7, art. IX.

<sup>129</sup> See generally Jordi Sandalinas, *Art IX of the Outer Space Treaty and Peaceful Purposes: Issues and Implementation* (Dec. 2, 2010) (unpublished report), [http://www.iislweb.org/docs/2010\\_Galloway\\_report.pdf](http://www.iislweb.org/docs/2010_Galloway_report.pdf) [<https://perma.cc/T47L-7XNH>].

tation.<sup>130</sup> The Outer Space Treaty appears to be silent on jamming at this point. However, jamming is an attack that may result in harm, so an examination under the Law of Armed Conflict is necessary.

The results of jamming may reach a magnitude necessary to trigger the Law of Armed Conflict. As previously mentioned, Protocol I seeks to prevent unnecessary suffering on the part of the civilian population and requires States to distinguish between civilian and military purposes.<sup>131</sup> As noted, the military's superior encryption capabilities suggest that civilians are more likely to be affected by average jamming attempts.<sup>132</sup> While most jamming attempts are temporary, there could be significant effects on civilian infrastructure if they are overextended. Further, the same satellites can alternate between civilian and military use, complicating the requirement that States distinguish between the two.<sup>133</sup>

Long-term interruption of satellite communication, navigation, and other networks via jamming could be harmful to the civilian population, especially if a State could not distinguish between a military and civilian objective. If this distinction cannot be made, the jamming should not occur because a State commencing an attack has the responsibility to distinguish military objects.<sup>134</sup> However, jamming can be—and likely would be—circumvented before inflicting significant harm on the civilian population. If there is no *significant* harm to the population (collateral damage is allowed) it is likely that the Law of Armed Conflict would not be triggered.<sup>135</sup> If jamming occurs via an earthbound uplink station, the Outer Space Treaty would likely not apply. However, as with jamming via another satellite, the Law of Armed Conflict would be triggered if there is significant harm to the civilian population.<sup>136</sup> The same principles that applied for jamming via satellites would likely apply to jamming occurring via an uplink of some kind. Likewise, if no significant harm to civilians occurs, then the Law of Armed Conflict would likely not apply.<sup>137</sup>

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<sup>130</sup> *Id.*

<sup>131</sup> See *supra* notes 75–79 and accompanying text.

<sup>132</sup> See *supra* notes 124–28 and accompanying text.

<sup>133</sup> See *supra* notes 75–79 and accompanying text.

<sup>134</sup> See *supra* notes 124–28 and accompanying text.

<sup>135</sup> See Boothby, *supra* note 123, at 212.

<sup>136</sup> See Boothby, *supra* note 123, at 212.

<sup>137</sup> See Boothby, *supra* note 123, at 212.

## 2. Dazzling

Dazzling typically involves “using a low-powered, ground-based laser to spread just enough radiation over the satellite’s electro-optical sensors to blind it.”<sup>138</sup> This can be temporary or permanent, depending on the intensity of the laser used.<sup>139</sup> The more high-powered the laser, the more likely the laser will disable, damage, or destroy the satellite.<sup>140</sup> As previously stated, the Outer Space Treaty does not prohibit all weapons from being used in space: it only prohibits those with the potential for mass destruction.<sup>141</sup> Additionally, the lasers used in dazzling operations have been Earth-based, so the Outer Space Treaty would likely not be triggered.<sup>142</sup> For this reason, it would be logical to examine dazzling under the scope of Protocol I.

An analysis of dazzling faces some of the same obstacles as jamming because the Law of Armed Conflict requires some significant danger to civilian life or well-being.<sup>143</sup> It is unlikely that low-powered lasers would automatically trigger Protocol I unless temporary blinding occurred to such a degree that vital civilian services were put at risk. Article 56 seeks to avoid a severe civilian loss, but there is a question of whether temporary blinding would cause such a degree of harm.<sup>144</sup> Unless the temporary blindness was to such a degree that the loss of civilian life was significantly foreseeable, the Law of Armed Conflict likely would not be triggered.

However, high-powered lasers present a different case.<sup>145</sup> A high-powered laser can result in the disabling, damaging, or destruction of a satellite.<sup>146</sup> On its surface, this would appear more likely to trigger Protocol I for a few reasons.<sup>147</sup> If a satellite is fully disabled, then a State loses full functionality of a significant device that could cripple the State in some circumstances. It

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<sup>138</sup> Jameson W. Crockett, *Space Warfare in the Here and Now: The Rules of Engagement for U.S. Weaponized Satellites in the Current Legal Space Regime*, 77 J. AIR L. & COM. 671, 675 (2012).

<sup>139</sup> *A History of Anti-Satellite Programs*, UNION OF CONCERNED SCIENTISTS (Feb. 2012), <http://www.ucsusa.org/nuclear-weapons/space-security/a-history-of-anti-satellite-programs> [<https://perma.cc/8XJP-GKY5>].

<sup>140</sup> *Id.*

<sup>141</sup> See Outer Space Treaty, *supra* note 7.

<sup>142</sup> See Crockett, *supra* note 138, at 675.

<sup>143</sup> See *supra* notes 123–34 and accompanying text.

<sup>144</sup> See Protocol I, *supra* note 22, art. 56.

<sup>145</sup> See *A History of Anti-Satellite Programs*, *supra* note 139.

<sup>146</sup> See *A History of Anti-Satellite Programs*, *supra* note 139.

<sup>147</sup> See Protocol I, *supra* note 22.



could also mean that a valuable piece of civilian infrastructure may be unavailable for the immediate future until a workaround or a replacement could be put into space. Depending on the satellite's value to civilian infrastructure in terms of civilian well-being, such disabling may trigger a violation of Protocol I.<sup>148</sup>

Perhaps the most significant hazard is that a dead satellite would be adrift in space without the ability to adjust, putting other satellites in danger.<sup>149</sup> In 2009, two satellites collided with each other over Siberia.<sup>150</sup> The collision resulted in over 1,000 individual pieces of debris traveling at over 26,000 miles per hour.<sup>151</sup> If this were the result of a high-powered laser, Articles 48 and 52 of Protocol I might have applied since they require a distinction to be made between military objectives and civilian objects.<sup>152</sup> A dead satellite, plus any debris from a collision, would lack control and could ultimately cause a larger degree of harm based on the high-powered laser attack. It would be important to hold States accountable under this scenario because eventually, the amount of debris could become so great that it would be impossible to safely navigate space.

The Kessler Syndrome is the idea that the accumulation of debris in space, especially from collisions, could ultimately cause a chain reaction resulting in an orbit no longer being usable.<sup>153</sup> For this reason, such an attack may also trigger Article 51, which seeks to protect civilians from the dangers that arise from military operations.<sup>154</sup> If such a cascading effect did take place, the destruction would not distinguish military from civilian, much less different States. These are the foreseeable results of a State taking steps to disable, damage, or destroy a satellite via dazzling. Unfortunately, if a satellite is disabled, it not only presents a danger to one State's infrastructure, but possibly to many other States' infrastructures. For this reason, dazzling via a high-powered laser would likely trigger the Law of Armed Conflict, and the State responsible for the attack would be held liable.

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<sup>148</sup> See Protocol I, *supra* note 22.

<sup>149</sup> Kyle Hill, *Some Dead Satellites Refuse to Go Quietly to Their Graves*, NAUTILUS (Nov. 13, 2013), <http://nautil.us/blog/some-dead-satellites-refuse-to-go-quietly-to-their-graves> [<https://perma.cc/26NL-SQJW>].

<sup>150</sup> *Id.*

<sup>151</sup> *Id.*

<sup>152</sup> See Protocol I, *supra* note 22, arts. 48, 52.

<sup>153</sup> *Micrometeoroids and Orbital Debris (MMOD)*, NASA (2014), [https://www.nasa.gov/centers/wstf/site\\_tour/remote\\_hypervelocity\\_test\\_laboratory/micrometeoroid\\_and\\_orbital\\_debris.html](https://www.nasa.gov/centers/wstf/site_tour/remote_hypervelocity_test_laboratory/micrometeoroid_and_orbital_debris.html) [<https://perma.cc/GE9E-PG4L>].

<sup>154</sup> See Protocol I, *supra* note 22, art. 51.

### 3. Kinetic Weapons

Kinetic weapons are characterized by the explosion they cause near their target.<sup>155</sup> Kinetic anti-satellite weaponry steers close to its target via rockets to coincide with the target's orbital path and detonates once it is in the target's vicinity.<sup>156</sup> The Outer Space Treaty does not forbid weapons in outer space, and Article IV's limitation of peacefulness is confined to the Moon and other celestial bodies.<sup>157</sup> Kinetic anti-satellite weapons do maintain an orbit, but States are only forbidden from placing objects carrying nuclear weapons and weapons of mass destruction in orbit around the Earth.<sup>158</sup> Under only the Outer Space Treaty, it is difficult to say such use of a kinetic weapon is not permissible. It does not appear that there is any provision in the Outer Space Treaty that prevents the use of a kinetic anti-satellite weapon.

Article 35 of Protocol I prohibits methods of warfare that can result in widespread long-term damage.<sup>159</sup> This is relevant to kinetic weapons primarily due to the lasting effect such a weapon could have in space: not only would there be the projectiles or debris from the kinetic weapon, but there would also be widespread debris from the destruction of the satellite.<sup>160</sup> Similar to the issues discussed in the dazzling section, it is unclear whether such a weapon could properly distinguish between military and civilian objects, as required by Article 48 of Protocol I.<sup>161</sup>

Kinetic weapons accomplish their missions by destroying satellites via explosions or direct impact.<sup>162</sup> Despite the method chosen, debris—which can travel in any direction—is the likely result.<sup>163</sup> As the debris travels, it risks colliding with even more satellites, further damaging civilian infrastructure around the world, which may be dependent on satellites. It appears that the Law of Armed Conflict is designed to protect against these situations.<sup>164</sup> Protocol I is largely concerned with the actions of States in a conflict and how their actions could affect civilians and civilian objects, but it also seeks to limit indiscriminate destruc-

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<sup>155</sup> Maogoto & Freeland, *supra* note 33, at 187.

<sup>156</sup> Maogoto & Freeland, *supra* note 33, at 188.

<sup>157</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>158</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>159</sup> Protocol I, *supra* note 22, art. 35.

<sup>160</sup> See Maogoto & Freeland, *supra* note 33, at 188.

<sup>161</sup> See Protocol I, *supra* note 22, art. 48.

<sup>162</sup> Boothby, *supra* note 123, at 208.

<sup>163</sup> See Boothby, *supra* note 123, at 208.

<sup>164</sup> See Protocol I, *supra* note 22, art. 51.



tion.<sup>165</sup> A kinetic weapon would likely violate several goals of the Law of Armed Conflict. For this reason, the use of a kinetic weapon would likely violate the Law of Armed Conflict.

### C. NATIONAL DEFENSES IN SPACE

Under the Outer Space Treaty, there are no inherent restrictions on States utilizing self-defense in outer space. The Treaty asks States to act with a peaceful purpose on the Moon and other celestial bodies, but this reiterates the great debate regarding what “peaceful” means.<sup>166</sup> When it comes to national defense, the Outer Space Treaty is silent. As to the Law of Armed Conflict, to this point, this note has largely discussed principles derived from *jus in bello*, which governs actual hostilities.<sup>167</sup> *Jus ad bellum* is the other principle of the Law of Armed Conflict, and it details whether the conflict itself is lawful or unlawful.<sup>168</sup>

States maintain an inherent right to use armed force in self-defense, and this right is embraced as lawful under *jus ad bellum*.<sup>169</sup> The right to self-defense is not unlimited because the principles of *jus in bello* still apply, but there is nothing inherently wrong with a State defending itself. If an attack were imminent and a State utilizing a defense system could justify the use of force while conforming with the Geneva Convention and the Additional Protocols, the use of force would be valid under the Law of Armed Conflict. However, any defenses could not use a nuclear weapon or any other weapon of mass destruction, as this is forbidden by the Outer Space Treaty.<sup>170</sup> If a defensive system targets a satellite, the State utilizing self-defense still risks triggering a violation of Protocol I for the same reasons discussed in the anti-satellite section. If a State complies with both the Outer Space Treaty and the Law of Armed Conflict, there is no restriction on a valid use of self-defense, if the methods and means of carrying out that self-defense conforms with both.

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<sup>165</sup> See Boothby, *supra* note 123, at 181–87.

<sup>166</sup> Outer Space Treaty, *supra* note 7, art. IV.

<sup>167</sup> See Walter Gary Sharp, Sr., *Revoking an Aggressor's License to Kill Military Forces Serving the United Nations: Making Deterrence Personal*, 22 MD. J. INT'L L. & TRADE 1, 10 (1998).

<sup>168</sup> *Id.* at 8.

<sup>169</sup> See U.N. CHARTER, art. 51.

<sup>170</sup> Outer Space Treaty, *supra* note 7.

## V. CONCLUSION

When there is a question of validity regarding the militarization or weaponization of outer space, and the Outer Space Treaty does not explicitly answer it, it is necessary to examine the Law of Armed Conflict. While the entirety of the Law of Armed Conflict applies to conflicts in space, Additional Protocol I to the Geneva Conventions comprises a significant portion of the analysis. This is due to the fact that Protocol I applies to international conflicts, reaffirms the four Geneva Conventions, and contributes additional protections to civilians and soldiers. These two areas of international law are largely considered to be customary international law, which is why they work best when jointly examined.

In the analysis of military personnel, anti-satellite weapons, and national defense apparatus in space, it is apparent that there are areas and scenarios in which the Outer Space Treaty does not apply, but the Law of Armed Conflict can fill such voids. As was briefly discussed, the ITU's inability to enforce its governing documents is a major concern. With the Outer Space Treaty and the Law of Armed Conflict, enforcement is not a concern because it can come from the International Court of Justice, the International Criminal Court, and ad hoc tribunals. Furthermore, the United Nations would be more likely to take action through sanctions or even the Security Council, depending on the State committing the violation.

While there are other doctrines and treaties, they may not have the same enforcement power as the joint-analytical approach utilizing both the Outer Space Treaty and the Law of Armed Conflict. This is because the Outer Space Treaty lays out the minimum standards for a State's activities in space, but also leaves areas in which a State could theoretically abuse ambiguity or loopholes. The Law of Armed Conflict is so expansive that it can provide clarity to the ambiguous areas left open by the Outer Space Treaty. Since both are considered customary international law, States cannot withdraw or pass legislation that would allow them to act counter to the principles presented in both the Outer Space Treaty and the Law of Armed Conflict.