

# OUTER SPACE: THE FINAL FRONTIER OR THE FINAL BATTLEFIELD?

EMILY TAFT<sup>†</sup>

## ABSTRACT

*Current law concerning the militarization and weaponization of outer space is inadequate for present times. The increased implementation of “dual-use” space technologies poses obstacles for the demilitarization of space. This paper examines how far the militarization of space should be taken and also whether weapons of any kind should be placed in space. Further steps must be taken in international space law to attempt to keep the militarization and weaponization of space under control in order to promote and maintain a free outer space for research and exploration.*

## INTRODUCTION

Outer space is the setting for many science fiction novels and movies, but what was once viewed as only fantasy may now be closer to reality than many realize. Space wars are no longer just a plot device, but rather a genuine issue that international law must acknowledge and address in the near future.<sup>1</sup>

The current international legal regime regarding outer space established by the United Nations (UN) under the Outer Space Treaty<sup>2</sup> is inadequate to handle many of the weaponization issues in space that are likely to arise in the near future and are even now beginning to occur. The Outer Space Treaty must either be amended or a new treaty must be formed in order to address the recent increase in the militarization of space and the threat of the weaponization of space. A change in space law needs to occur to keep space from becoming a hazardous battleground. But, whether such a change is feasible in today’s security climate is still unclear.

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<sup>†</sup> Duke University School of Law, J.D. expected 2018; Colgate University, B.A. 2015. I would like to thank Maj. Gen. Charles J. Dunlap, Jr. for his mentorship.

<sup>1</sup> See José Monserrat Filho, *Total Militarization of Space and Space Law: The Future of the Article IV of the 67’ Outer Space Treaty*, 40 PROC. ON L. OUTER SPACE 358, 361–62 (1997).

<sup>2</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies art. 6, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205.

## I. THE CURRENT ISSUES IN SPACE

The control of space became a national security concern for the United States in 1957 when the Soviet Union launched Sputnik into orbit.<sup>3</sup> The United States responded by passing the National Aeronautics and Space Act creating the National Aeronautics and Space Administration (NASA) and propelling the world into the space race.<sup>4</sup> The space race did not end when the United States successfully placed a man on the moon, but has instead accelerated from that point with advances in technology. Military support in space dramatically increased between the Vietnam War and the 1991 Persian Gulf War, which caused many to call the Persian Gulf War the first “space war.”<sup>5</sup>

The number of satellites in space has grown significantly since the 1991 Gulf War. Today, there are over 1,300 active satellites in space and over 2,500 inactive ones.<sup>6</sup> The United States owns the most with over half of the active satellites, and Russia and China follow with about 130 each.<sup>7</sup> Not all of these satellites are exclusively “military satellites,” but the growing trend is to have dual-purpose satellites by utilizing “civilian satellites” for military purposes or vice versa. For example, “[a] satellite that in peacetime uses the global positioning system (GPS) constellation of spacecraft for navigation purposes, may in wartime utilize that same capability to target bombs or remotely piloted vehicles.”<sup>8</sup> This civilian/military overlap adds to the difficulty in developing a functioning legal framework for the militarization of space.

Several recent events have placed the issues surrounding the weaponization of space at the forefront of global headlines. First, the Chinese tested anti-satellite missile technology (ASAT) in 2007.<sup>9</sup> This launch sent two clear messages to the world: the Chinese were developing

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<sup>3</sup> Adam G. Quinn, *The New Age of Space Law: The Outer Space Treaty and the Weaponization of Space*, 17 MINN. J. INT’L L. 475, 478 (2008).

<sup>4</sup> *Id.*

<sup>5</sup> MARCIA S. SMITH, CONG. RESEARCH SERV., IB92011, U.S. SPACE PROGRAMS: CIVILIAN, MILITARY, AND COMMERCIAL 8 (2006).

<sup>6</sup> Malcolm Ritter, *How Many Man-Made Satellites Are Currently Orbiting Earth?*, TALKING POINTS MEMO (March 28, 2014, 9:37 AM), <http://talkingpointsmemo.com/idealab/satellites-earth-orbit>.

<sup>7</sup> *Id.*

<sup>8</sup> María de las Mercedes Esquivel de Cocca, *Militarization of Space*, 45 PROC. ON L. OUTER SPACE 216, 219 (2002).

<sup>9</sup> See Quinn, *supra* note 3, at 476. Russia has also tested earth-based ASAT weaponry and has caused damage to orbiting satellites. See Esquivel de Cocca, *supra* note 8, at 219.

weapons that had the potential to destroy objects in orbit,<sup>10</sup> and space debris could soon be a major problem.<sup>11</sup> Second, the United States has also successfully shot down its own malfunctioning satellite.<sup>12</sup> The U.S. Missile Defense Agency is working on a \$400 million project to put sensors on current satellites in orbit that can detect the military capabilities of other satellites and spacecraft.<sup>13</sup> Finally, North Korea has been making advancements toward getting up to space, which underscores the fear of instability in space.<sup>14</sup>

While there are currently no weapons in space,<sup>15</sup> the events described above show that the weaponization of space is not as far away as some might think.<sup>16</sup> Thus, it is important to create a legal regime that can handle modern technology trends and place sufficient limits on

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<sup>10</sup> Quinn, *supra* note 3, at 476.

<sup>11</sup> See Anél Ferreira-Snyman, *Selected Legal Challenges Relating to the Military Use of Outer Space, with Specific Reference to Article IV of the Outer Space Treaty*, 18 POTCHEFSTROOM ELEC. L.J. 488, 490 (2015).

<sup>12</sup> Esquivel de Cocca, *supra* note 8, at 219–20 (identifying other anti-satellite efforts that the United States are known to be currently working on, including the Mid-Infrared Advanced Chemical Laser (MIRACL) lasers (which Russia also has the capability to employ), mid-course missile interceptors used to target satellites, and intermediate-range ballistic missiles (IRBMs) capable of reaching lower-Earth orbit (LEO)).

<sup>13</sup> Marcus Weisgerber, *Pentagon Eyes Missile-Defense Sensors in Space*, DEFENSE ONE (Aug. 30, 2016), [http://www.defenseone.com/technology/2016/08/pentagon-wants-put-missile-defense-radar-space/131162/?oref=defenseone\\_today\\_nl](http://www.defenseone.com/technology/2016/08/pentagon-wants-put-missile-defense-radar-space/131162/?oref=defenseone_today_nl).

<sup>14</sup> Blair Stephenson Kuplic, *The Weaponization of Outer Space: Preventing an Extraterrestrial Arms Race*, 39 N.C. J. INT'L L. & COM. REG. 1123, 1125 (2014) (finding that, while North Korea reportedly developed the engine “to place a satellite into outer space,” its intentions may not be so benign, and this further underscores the need to halt the space arms race).

<sup>15</sup> See Filho, *supra* note 1, at 366 (“Outer space not only continues free of any kind of weapon but has never been the stage for a single hostile act.”); Quinn, *supra* note 3, at 494 (“While no state wants to be the first to openly weaponize space, many are investing in dual-use technology.”).

<sup>16</sup> See, e.g., Alexander Chanock, *The Problems and Potential Solutions Related to the Emergence of Space Weapons in the 21st Century*, 78 J. AIR L. & COM. 691, 694 (2013) (“[T]he United States has taken a number of policy steps that illustrate it no longer views space as existing solely for peaceful means.”); see also Kuplic, *supra* note 14, at 1137–40 (identifying other technologies currently being developed, such as kinetic energy ASAT capabilities; co-orbital ASAT capabilities, which “use a missile armed with explosives” to detonate when in close proximity to a target; directed energy capabilities, such as dazzlers, lasers, or high-powered microwave frequencies; “soft-kill” weapons, which disable rather than destroy; electromagnetic weaponry; and space bombers).

military space activity before nations cross a line in space from which the world cannot come back. While the UN has continually failed to reach a solution in recent years, primarily because the United States refuses to come to the negotiation table,<sup>17</sup> the events and technologies mentioned above and growing international tension should push nations to find a solution that can be agreed upon by all the spacefaring nations.

## II. THE CURRENT LAW IN SPACE

When Russia launched Sputnik, the world watched with fear and concern for the future. The United States followed suit, and soon space was more within reach than it had ever been before. Thus, the world had to quickly create a legal framework to govern space exploration and space warfare. “Where humans go, law follows.”<sup>18</sup>

### A. *International Law*

The UN created the United Nations Committee on the Peaceful Use of Outer Space (COPUOS)<sup>19</sup> to better address the growing issues in space, and it has grown into “one of the largest United Nations committees.”<sup>20</sup> COPUOS has drawn on the experiences from the regulation of other international commons, such as international waters and terrestrial treaties.<sup>21</sup>

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<sup>17</sup> See DONALD H. RUMSFELD ET AL., REPORT OF THE COMMISSION TO ASSESS UNITED STATES NATIONAL SECURITY SPACE MANAGEMENT AND ORGANIZATION 80 (2001) [hereinafter RUMSFELD SPACE COMMISSION]; see also Chanock, *supra* note 16, at 694 (“Consistent with its development of weapons for space, the United States has taken a number of policy steps that illustrate it no longer views space as existing solely for peaceful means. This is exemplified by the United States withdrawal from the Anti-Ballistic Missile (ABM) Treaty in 2001.”); Kuplic, *supra* note 14, at 1157, 1160 (“The United States, however, has consistently resisted measures taken to prevent an arms race in outer space, abstaining from or even voting against numerous PAROS resolutions passed by the United Nations General Assembly. Additionally, the United States has resisted proposals to give the United Nations Conference on Disarmament a mandate to open formal negotiations on space weapons. When explaining its resistance to talks about preventing an arms race in outer space, the United States denies that there is either current or an imminent arms race in outer space.”).

<sup>18</sup> Jesse Londin, *Who Owns Mars? The Law in Outer Space*, ROCKET LAW. (Aug. 20, 2012), <https://www.rocketlawyer.com/blog/who-owns-mars-the-law-in-outer-space-98425>.

<sup>19</sup> *Committee on the Peaceful Uses of Outer Space: 2017*, U.N. OFF. FOR OUTER SPACE AFF., <http://www.unoosa.org/oosa/en/copuos/index.html> (last visited Mar. 5, 2017).

<sup>20</sup> Quinn, *supra* note 3, at 478.

<sup>21</sup> *Id.* at 483.

### 1. *The Outer Space Treaty*

The Outer Space Treaty is the only space treaty with any remaining bite today and forms the basic legal framework of international space law.<sup>22</sup> The Treaty establishes that “[t]he exploration and use of outer space . . . shall be carried out for the benefit and in the interests of all countries . . . and shall be the province of all mankind.”<sup>23</sup> Article IV of the Treaty is the most relevant to the militarization of space and provides:

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, instal [sic] such weapons on celestial bodies, or station such weapons in outer space in any other manner. 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 maneuvers 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.<sup>24</sup>

Notably, the Treaty does not mention or give guidance on placing non-weapons of mass destruction in space,<sup>25</sup> using “intercontinental ballistic missiles with nuclear warheads flying in orbit [for] only a part of the earth's circumference,”<sup>26</sup> or using dual-use spacecraft.<sup>27</sup> There is further confusion about what constitutes a “peaceful purpose.”<sup>28</sup>

### 2. *Other Treaties*

The UN attempted to take demilitarization a step further by creating the Moon Agreement. This Agreement attempted to further

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<sup>22</sup> *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, U.S. DEP'T ST., <https://www.state.gov/t/isn/5181.htm> (last visited Mar. 5, 2017).

<sup>23</sup> *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, *supra* note 2, at art. 1.

<sup>24</sup> *Id.*, at art. 4 (emphasis added).

<sup>25</sup> Kuplic, *supra* note 14, at 1144.

<sup>26</sup> Andrzej Jacewicz, *Problems of the Militarization of Space and International Law*, 14 POLISH Y.B. INT'L L. 145, 147 (1985).

<sup>27</sup> Chanock, *supra* note 16, at 701.

<sup>28</sup> *See Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, *supra* note 2, at art. 4.

codify restrictions on the appropriation of outer space, specifically restrictions on nations claiming parts of celestial bodies, but was unsuccessful as no spacefaring nation ratified it.<sup>29</sup> After the Moon Agreement, the UN continued attempts to further expand and clarify the Outer Space Treaty by creating new treaties or by amendments to the current treaties, but these expansions were continually denied by most of the spacefaring nations and faced the most resistance from the United States.<sup>30</sup> The following are a few of these “expansionary treaties,” none of which have been ratified by the United States.

The Rescue Agreement expanded on Article V of the Outer Space Treaty by calling “for the rendering of all possible assistance to astronauts in the event of accident, distress or emergency landing, the prompt and safe return of astronauts, and the return of objects launched into outer space” in order “to promote international co-operation in the peaceful exploration and use of outer space.”<sup>31</sup> The Space Liability Convention “provided a more detailed framework [for liability issues], ameliorating the concerns of non-space actors who feared bearing the cost of a space accident over its territory when it was not posing the same risk to space actors.”<sup>32</sup> The Space Registration Convention “formalized who and what must be registered with the United Nations.”<sup>33</sup>

To better address the current issues involving the weaponization of space, the international legal framework needs to change so that it places limits on what is prohibited in space beyond just weapons of mass destruction. This change must either be accomplished by amendment to the Outer Space Treaty or by the creation of a new treaty altogether. To make this change, however, the United States must agree to at least show up to the negotiation table.

### *B. Domestic Law*

In 1958, in response to the Soviet Union’s successful launch of Sputnik, Congress passed the National Aeronautics and Space Act, which

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<sup>29</sup> Quinn, *supra* note 3, at 482 (“The treaty aimed too high, however, and was never ratified by any space actor.”).

<sup>30</sup> Kuplic, *supra* note 14, at 1157.

<sup>31</sup> Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space art. 1, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119.

<sup>32</sup> Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187.

<sup>33</sup> Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15. For further examples of rejected amendments to the Outer Space Treaty, see Filho, *supra* note 1, at 366–67.

created NASA and specified that military space activities would be conducted by the Department of Defense (DOD).<sup>34</sup> The idea of the DOD placing weapons in space is controversial. While some argue that putting weapons in space will set a dangerous precedent,<sup>35</sup> others argue that the United States needs to remain the leader in the weaponization of space so that it can control the limits.<sup>36</sup>

### *1. The Bush Administration*

In 2006, the Bush Administration released its overtly aggressive Space Policy, which took a unilateral approach to space policy, stating:

The United States will oppose the development of new legal regimes or other restrictions that seek to prohibit or limit U.S. access to or use of space. Proposed arms control agreements or restrictions must not impair the rights of the United States to conduct research, development, testing, and operations or other activities in space for U.S. national interests.<sup>37</sup>

The policy “showcased the United States’ continued departure from the idealistic intentions originally embodied in the Outer Space Treaty.”<sup>38</sup> Under this policy, the United States could put weapons in space if it deemed it necessary to protect the United States’ space capabilities or to sustain its advantage in space.

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<sup>34</sup> National Aeronautics and Space Act of 1958, Pub. L. No. 85-568, 72 Stat. 426 (1958).

<sup>35</sup> See Ferreira-Snyman, *supra* note 11, at 521 (quoting FRANCIS LYALL & PAUL B. LARSEN, *SPACE LAW: A TREATISE* 532 (2009) (“Once one state begins to assert unilateral authority to weaponise outer space with the implicit threat of the use of those weapons, other states will use that precedent to assert their own unilateral authority.”); *see also* Kuplic, *supra* note 14, at 1141 (“[I]f countries currently capable of militarizing outer space, such as the United States and Russia, pursue unhindered military operations in outer space, other nations will likely follow, thereby bringing potentially unpredictable—or even dangerous—players into the mix.”). This idea of not setting a dangerous precedent deterred the United States from “beating” the Soviet Union into space during the Cold War. *See* Mike Wall, *Space Race: Could the U.S. Have Beaten the Soviets into Space?*, SPACE.COM (April 8, 2011, 7:00 AM), <http://www.space.com/11336-space-race-united-states-soviets-spaceflight-50years.html>.

<sup>36</sup> *See* RUMSFELD SPACE COMMISSION, *supra* note 17 (showing that the new U.S. space policy would move the United States in the direction of fielding offensive and defensive space weapons).

<sup>37</sup> Off. of Sci. & Tech. Policy, Exec. Office of the President, National Space Policy of the United States of America 2 (Aug. 31, 2006).

<sup>38</sup> Quinn, *supra* note 3, at 492.

## 2. *The Obama Administration*

In 2010, the Obama Administration released its National Space Policy, which seemed to take a softer and less unilateral stance than the Bush Administration had, stating, “[t]he United States will consider proposals and concepts for arms control measures if they are equitable, effectively verifiable, and enhance the national security of the United States and its allies.”<sup>39</sup> In the 2012 Department of Defense Strategy Report, the Obama Administration clarified its space position. It elaborated that “peaceful purposes” include military activities in furtherance of national and homeland security purposes.<sup>40</sup> The Strategy Report concluded that the DOD will “develop capabilities, plans, and options” for space defense measures.<sup>41</sup>

The Bush and Obama Administrations indicated that the United States does not intend to take a passive approach to its domestic space policy. The Trump Administration has already signed space legislation demonstrating it too will follow this approach.<sup>42</sup> To protect its assets in space and to ensure that it acts in accordance to international law, the United States must join the discussion to amend the current legal framework in space.

### III. ANALYSIS

There is a clear disconnect between the aspirations of the Outer Space Treaty and current realities. The Outer Space Treaty is too outdated to keep up with the current technology trends in space satellites and weaponry. While the Treaty continues to successfully keep nuclear weapons out of space, as technology advances, nuclear weapons are not the biggest concern in outer space anymore. To ensure global stability, a clearer line must be drawn concerning the limits of space weaponry. Many questions concerning the militarization and weaponization of space should

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<sup>39</sup> White House, National Space Policy of the United States of America 3 (June 28, 2010), [https://obamawhitehouse.archives.gov/sites/default/files/national\\_space\\_policy\\_6-28-10.pdf](https://obamawhitehouse.archives.gov/sites/default/files/national_space_policy_6-28-10.pdf).

<sup>40</sup> *Id.* (declaring that “‘peaceful purposes’ allow[ ] for space to be used for national and homeland security activities” and that “[t]he United States will employ a variety of measures to help assure the use of space for all responsible parties . . . [and] deter others from interference and attack . . . and, if deterrence fails, defeat efforts to attack them.”).

<sup>41</sup> *Id.* at 14 (stating that the President specified that the Secretary of Defense must “develop capabilities, plans, and options” for space defense measures).

<sup>42</sup> See Calla Cofield, *President Trump Signs NASA Authorization Bill*, SPACE.COM (March 21, 2017, 2:46 PM), <http://www.space.com/36154-president-trump-signs-nasa-authorization-bill.html>.

be discussed and answered proactively now, rather than reactively in the future after a crisis situation has occurred in space.

*A. The Militarization of Space Versus the Demilitarization of Space*

The militarization and the weaponization of space are two separate concepts. The militarization of space is a passive concept and merely entails having a military presence in space. Space is currently militarized because nations have placed technology designed or operated by the military into space, in particular reconnaissance satellites and GPS systems.<sup>43</sup> Space is already militarized to a certain extent with the current satellite capabilities in space, but there are not yet any weapons in orbit in space.<sup>44</sup> Thus, at the onset it is best to address whether space can or should be demilitarized, and if not, how far the militarization of space ought to go. Where along the spectrum from no militarization of space to unbridled militarization and weaponization of space should the line be drawn that divides the acceptable and allowed from the unacceptable and forbidden?

*1. Demilitarization of Space: Have Peaceful and Military Uses of Spacecraft Become Too Intertwined?*

Currently, the militarization of space has primarily been the passive use of space, focusing on the use of various reconnaissance and communications functions.<sup>45</sup> Some argue that space has always been militarized because “military considerations were at the heart of the original efforts to enter space and have remained so to the present day.”<sup>46</sup> Of the over 1,300 satellites in space, it is estimated that about three-fourths perform various military functions.<sup>47</sup> Much of these military functions, however, are being performed not by military-owned satellites, but rather through the use of commercial and civilian spacecraft. The scientific research available in “the final frontier”<sup>48</sup> of space is appealing not only to

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<sup>43</sup> See Ferreira-Snyman, *supra* note 11, at 499 (“The militarisation of outer space may therefore be described as the passive military use of outer space . . . . The weaponisation of outer space may be described as ‘the deployment of weapons of an offensive nature in outer space or on the ground with their intended target located in space.’”).

<sup>44</sup> See *id.* at 501 (noting that the “vulnerability of space systems to cyber attacks have created international fear that weaponisation of space is a real possibility”).

<sup>45</sup> *Id.* at 499.

<sup>46</sup> *Id.* at 495 (quoting MICHAEL SHEEHAN, *THE INTERNATIONAL POLITICS OF SPACE 2* (2007)).

<sup>47</sup> Jacewicz, *supra* note 26, at 145 (finding that the military nature of satellites is “primarily in the field of reconnaissance and communications”).

<sup>48</sup> This phrase was made famous by Captain Kirk (that is, William Shatner) in the opening narration of the *Star Trek* television series. See, e.g., *Star Trek: The Man Trap* (NBC television broadcast Sept. 8, 1966).

scientists, but also the military. This ideal coupled with the costs of getting into space has caused peaceful scientific research and passive military activity to become tightly intertwined.

Getting to space is expensive,<sup>49</sup> and once up in space, there are a limited number of orbital paths available.<sup>50</sup> Thus, at the onset, it was clear that military-civilian cooperation in space was needed to efficiently and effectively explore and utilize what space has to offer.<sup>51</sup> Civilian and military space missions typically share launch pads, launch vehicles, space platforms, and satellites.<sup>52</sup> Because of this dual-purpose approach, prohibiting any military activity in effect dampens the ability to use outer space at all, including for “peaceful purposes” since all space exploration relies so heavily on military technology and intel.<sup>53</sup> For example, a satellite that “in peacetime uses the global positioning system (GPS)” for navigation purposes, may “in wartime utilize that same capability to target bombs or remotely piloted vehicles.”<sup>54</sup>

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<sup>49</sup> See Andrew Chaikin, *Is SpaceX Changing the Rocket Equation?*, AIR & SPACE MAG. (January 2012), <http://www.airspacemag.com/space/is-spacex-changing-the-rocket-equation-132285884/?all> (“[A] Falcon 9 launch costs an average of \$57 million, which works out to less than \$2,500 per pound to orbit. That’s significantly less than what other U.S. launch companies typically charge, and even the manufacturer of China’s low-cost Long March rocket (which the U.S. has banned importing) says it cannot beat SpaceX’s pricing.”).

<sup>50</sup> Micah Zenko, *A Code of Conduct for Outer Space*, COUNCIL ON FOREIGN REL. (Nov. 30, 2011), <http://www.cfr.org/space/code-conduct-outer-space/p26556> (“The Obama administration has accurately described outer space as increasingly ‘congested, contested, and competitive.’”).

<sup>51</sup> Elizabeth Seebode Waldrop, *Integration of Military and Civilian Space Assets: Legal and National Security Implications*, 55 A.F. L. REV. 157, 161 (2004). This merging of military and civilian workforces has also been seen in the cybersecurity realm. See William J. Lynn III, *Defending a New Domain: The Pentagon’s Cyberstrategy*, 89 FOREIGN AFF. 97 (2010); Michael S. Rogers, *A Challenge for the Military Cyber Workforce*, 1 MIL. CYBER AFF. 2 (2015).

<sup>52</sup> See Waldrop, *supra* note 51, at 163 (stating that “the sheer expense of placing space systems in orbit . . . [requires] a degree of technological and practical compatibility . . . [and] the physical limitation of available orbits and radio frequencies for military and civilian systems demands a detailed technological awareness of many attributes”); see also SMITH, *supra* note 5, at 8 (stating that the DOD “uses some civilian satellites and vice versa”).

<sup>53</sup> See Jacewicz, *supra* note 26, at 165 (arguing that “in order to achieve the prohibition under international law of any activities for military purposes, it is necessary to be able to precisely distinguish satellites”).

<sup>54</sup> Esquivel de Cocca, *supra* note 8, at 219; see also Ferreira-Snyman, *supra* note 11, at 491.

Stopping the current practices in space and clarifying the line between military and civilian uses of space will not likely happen. The distinction between military and non-military uses of space is already too blurred to allow the separation of military uses that will be required to demilitarize space.<sup>55</sup> Further, to borrow a scientific concept, an object in motion stays in motion.<sup>56</sup> In other words, the world seems to be past the point of being able to demilitarize outer space.

Moreover, any attempt now to prohibit the use of dual purpose technologies in outer space would likely be unsuccessful because the legality of these has been long accepted.<sup>57</sup> Therefore, at a minimum, passive military activity in space is here to stay. The key question now that needs to be addressed is whether active military use of space (i.e., the weaponization of space) is inevitable.

The merging of civilian and military technologies in space not only makes it nearly impossible to demilitarize space, but also brings other legal issues into play. Military use of civilian spacecraft and satellites “may turn them, as well as their supporting infrastructure, into a bona fide target for future opponents.”<sup>58</sup> This increased interdependence of the military and civilians in space could lead to unforeseen consequences if war does ever arise in space, namely that (1) “civilians risk being characterized as unlawful combatants directly participating in hostilities and therefore being unprotected” under the Law of Armed Conflict (LOAC) and (2) “military reliance on civilian space systems may turn those systems into legitimate targets.”<sup>59</sup>

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<sup>55</sup> See e.g. Ferreira-Snyman, *supra* note 11, at 491 (“For example, while satellite technology in the form of remote sensing can be used to gather meteorological data, it can also be used to gather intelligence in other states. Similarly, Global Navigation Satellite Systems (GNSS) or Global Position Systems (GPS) can be used for civilian purposes, but also to direct bombs or cruise missiles. Telecommunication satellites are used to transmit not only civilian communications but also military messages. Remote sensing by means of satellite is also used in the civilian as well as military spheres.”).

<sup>56</sup> See NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, *THE FIRST AND SECOND LAWS OF MOTION* (1996) (quoting Sir Isaac Newton’s First Law of Motion).

<sup>57</sup> Ferreira-Snyman, *supra* note 11, at 497–98.

<sup>58</sup> Waldrop, *supra* note 51, at 157 (quoting Charles J. Dunlap, Jr., U.S. Air Force, *Technology: Recomplicating Moral Life for the Nation’s Defenders*, 29 *PARAMETERS* 24, 30 (1999)).

<sup>59</sup> *Id.* at 230. For more information on this issue, see Walter D. Reed, *Military Use of the Space Shuttle*, 13 *AKRON L. REV.* 665 (1980); Sean C. Temple, *Developing Tomorrow’s Space War Fighter: The Argument for Contracting Out Satellite Operations*, 29 *AIR & SPACE POWER J.* 83 (2015).

## 2. *How Far Should the Militarization of Space Progress?*

Because it is nearly impossible to demilitarize space at this point, the next logical step is to determine how far the militarization of space should go in order to determine the best legal framework to address these limits. Should the global community attempt to keep things from progressing further than they already have, or should it embrace weaponry in space and work to set limits on the kinds of weapons allowed in space? Either option requires further clarification of the law in space. The optimal level of weaponization must protect the free exploration of space for scientific and research purposes. The world cannot afford to crowd out peaceful space exploration with the over-weaponization of space. Below are some of the arguments for and against weaponizing space and making space a battleground. Note, however, this section focuses primarily on the arguments for and against the weaponization of space from the United States' perspective.

For the United States, placing weaponry in space may allow it to maintain its "control" of space and ensure that it keeps its advantage in the space race.<sup>60</sup> If the weaponization of space is inevitable, then it is in the United States' best interest to lead the pack and be the one to set the precedent on what is acceptable and what is not.<sup>61</sup> Many proponents of weaponizing space argue that "the United States needs to be at the forefront of space weaponization and cannot afford to let its military power slip away by not being prepared for the future of warfare."<sup>62</sup> While this will have huge costs associated with it at the onset, having to play catch-up later will be much more costly. These concerns were seen in the 2001 Rumsfeld Space Commission, which claimed that the United States may be vulnerable to a "Space Pearl Harbor."<sup>63</sup>

Furthermore, the United States continues to remain vulnerable as space grows in importance for national security, the economy, and technological advances. It is imperative that the United States' access to space continue unobstructed, and many argue that it must put weapons in

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<sup>60</sup> See Chanock, *supra* note 16, at 692 ("Proponents of space weaponization see this development as a natural progression and imperative for the United States to maintain its military dominance."); Filho, *supra* note 1, at 359 (the DOD maintains that United States control in space will "probably require the development of space-based weapons").

<sup>61</sup> See Quinn, *supra* note 3, at 495 ("Given the inevitability of the weaponization of space, it behooves every nation to weaponize as soon as possible to stay ahead of the curve.") (citations omitted).

<sup>62</sup> Chanock, *supra* note 16, at 699.

<sup>63</sup> *Id.*

space in order to ensure this in the current age.<sup>64</sup> Space weaponry will not only protect the United States' assets both on Earth and in space, but will also deter further conflict with other nations.<sup>65</sup>

On the other hand, the United States needs to balance its desire to maintain its advantage in space with being careful not to set a dangerous precedent regarding the weaponization of space.<sup>66</sup> Placing weapons in space will almost certainly escalate the space arms race.<sup>67</sup> As Lyall and Larsen observed: "Once one state begins to assert unilateral authority to weaponize outer space with the implicit threat of the use of those weapons, other states will use that precedent to assert their own unilateral authority."<sup>68</sup> Nations which currently have no space capabilities would race to join those spacefaring nations "thereby bringing potentially unpredictable — or even dangerous — players into the mix."<sup>69</sup> Weapons in space "create distrust and suspicion among states in a world that is increasingly in need of global security and cooperation."<sup>70</sup> This compels many to argue that the new legal framework that is needed must prohibit any type of weapon in space.<sup>71</sup>

Furthermore, as mentioned above, the United States has become quite dependent on its space-based technology for both military use and daily civilian life. The satellites that are so crucial to the United States may become more vulnerable "by a proliferation of ASAT weapons in outer space."<sup>72</sup> While the United States is currently dominant in space, the production of ASAT weapons is relatively simple and affordable. Thus, superiority in space does not necessarily mean that the nation is

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<sup>64</sup> See Filho, *supra* note 1, at 361 ("To maintain our current advantage in space even as more users develop capabilities and access, we must focus sufficient intelligence efforts on monitoring foreign use of space-based assets as well as developing the capabilities required to protect our systems and *prevent hostile use of space by an adversary.*") (emphasis added).

<sup>65</sup> Everett C. Dolman, *Astropolitics and Astropolitik: Strategy and Space Deployment*, in HARNESSING THE HEAVENS: NATIONAL DEFENSE THROUGH SPACE 111 (Paul G. Gillespie & Grant T. Weller eds., 2008).

<sup>66</sup> See Wall, *supra* note 35.

<sup>67</sup> Jinyuan Su, *Use of Outer Space for Peaceful Purposes: Non-Militarization, Non-Aggression and Prevention of Weaponization*, 36 J. SPACE L. 253, 271 (2010).

<sup>68</sup> Ferreira-Snyman, *supra* note 11, at 521 (quoting LYALL & LARSEN, *supra* note 35, at 532).

<sup>69</sup> Kuplic, *supra* note 14, at 1142.

<sup>70</sup> *Id.* at 1162.

<sup>71</sup> See Jacewicz, *supra* note 26, at 166 ("[T]he primary aim which ought to be striven for is the legal prohibition of placing any type of weapons in outer space.").

<sup>72</sup> Kuplic, *supra* note 14, at 1141.

invulnerable to “an attack that could cripple military operations or even the daily life of civilian society.”<sup>73</sup>

A final concern with the weaponization of space, which came to light with the recent Chinese ASAT weapons testing, is the amount of space debris that may be produced from the destruction of spacecraft, satellites, and weapons. Space debris is a significant threat to any structure in space. The debris from an ASAT weapon attack could easily damage many other unintended space targets.

The United States has an advantage in space, which places it in the best position to influence the next international legal regime for space activity. The current framework under the Outer Space Treaty no longer adequately regulates space activity, particularly military activity in space.<sup>74</sup> A new framework must be developed and agreed upon that will modernize and clarify the limits on weapons in space, and the United States likely must lead the charge for any change to be successful.

### *B. The Future of International Space Law*

The current state of outer space law warrants revitalization. The Outer Space Treaty, specifically Article IV, has become largely ineffective and irrelevant. “[A]rticle IV of the Outer Space Treaty cannot adequately deal with the current issues relating to the military use of outer space,”<sup>75</sup> but many of the spacefaring nations, especially the United States, refuse to sign on to additional space treaties. A new legal framework for space must be established by amending the Outer Space Treaty at a minimum or alternatively by forming a new treaty altogether.<sup>76</sup> The new legal framework, whether it allows weapons in space or not, must protect the freedom and ability for all to explore and research in space. This will require strict legal security with “the prevalence of objective clear norms which guarantee the domain of the law over the individual will.”<sup>77</sup>

When the Outer Space Treaty was adopted in 1967, nuclear weapons were the only real threat to the outer space community.<sup>78</sup> Since then, there have been huge technological advances, and the weapons

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<sup>73</sup> *Id.* at 1161.

<sup>74</sup> Filho, *supra* note 1, at 366.

<sup>75</sup> Ferreira-Snyman, *supra* note 11, at 520.

<sup>76</sup> See Chanock, *supra* note 16, at 702 (“The treaty has too many holes and not enough teeth to police a space arms race among the world superpowers. As a result, it is vital that the international community amend the treaty or create an entirely new one that is properly constructed to handle the emergence of space weapons in a realistic and efficient manner.”).

<sup>77</sup> Filho, *supra* note 1, at 366.

<sup>78</sup> Kuplic, *supra* note 14, at 1137.

discussed earlier “pose equally significant threats to global security.”<sup>79</sup> In addition, the Outer Space Treaty “contains textual ambiguities that do not easily lend themselves to one cohesive interpretation.”<sup>80</sup>

The first option, which is more realistic, to address these issues and ambiguities is to amend the Outer Space Treaty. Like other U.N. treaties, the Outer Space Treaty allows for amendment and for member withdrawal.<sup>81</sup> Article XV permits countries to propose amendments.<sup>82</sup> For an amendment to enter into force, it must be accepted by a majority of parties, but it will only be binding on those countries that explicitly approve the amendment.<sup>83</sup> Article XVI authorizes a country to withdraw from the Treaty.<sup>84</sup> If a country chooses to withdraw, it will take effect a year after that country has submitted a written notification of its intentions to the depositary states—the United States, Russia, and the United Kingdom. This could be accomplished in part by amending the current language of “other peaceful purposes” to expressly say “non-aggressive purposes.” An ongoing debate concerning the definition of “peaceful purposes” has ensued between the spacefaring nations and the non-space nations, especially concerning whether it means “non-military” or “non-aggressive.”<sup>85</sup>

To believe that “peaceful purposes” could mean “non-military” in today’s world is naïve. As discussed above, space has already been militarized to a certain extent. The fact that so much of space technology is dual-use means that prohibiting any military use at this point is nearly impossible.<sup>86</sup> Moreover, no current spacefaring nation would agree to this definition because its civilian and military space activity is so interdependent.<sup>87</sup> In contrast, defining “peaceful purposes” as “non-aggressive” use of outer space “places a limitation on the behavioral, rather than technological, aspect of State actions in outer space.”<sup>88</sup> Under this definition, states would be able to continue passive military action in space and would even be able to place weapons in space as a deterrence

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<sup>79</sup> *Id.*

<sup>80</sup> *Id.*

<sup>81</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies art. 16, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205.

<sup>82</sup> *Id.*

<sup>83</sup> *Id.*

<sup>84</sup> *Id.*

<sup>85</sup> Jacewicz, *supra* note 26, at 158.

<sup>86</sup> Su, *supra* note 67, at 259.

<sup>87</sup> *Id.* at 272.

<sup>88</sup> *Id.* at 261.

statement, but could not use those weapons or threaten to use force from outer space.<sup>89</sup> States would also be allowed to place weapons in space as a defensive maneuver and use them for self-defense purposes.

Under international law, a nation may use force when authorized by the UN Security Council, in accordance with Article 42 of the UN Charter, and in self-defense, in accordance with Article 51 and with customary international law.<sup>90</sup> Both of these uses of force would still be available to nations in space if the Outer Space Treaty were amended to say “non-aggressive,” rather than “peaceful purposes.” Such an amendment would allow nations to continue to develop space weaponry and even put that weaponry in orbit, but it would keep space from becoming an active battlefield, a necessity for allowing the continued free research and exploration of space. Note, however, that there would still be a prohibition on nuclear weapons in space and a prohibition on colonizing or placing bases on the moon or other celestial bodies.

A second and more optimal option would be to start over and create a whole new treaty. To ensure that space will remain a final frontier open to all nations, such a new treaty would likely need to lay out a scheme for a “non-aggressive” use of space by creating “rules related to the development and deployment of weapons capable of damage, destruction, or interference.”<sup>91</sup> It would also be beneficial to establish an international body designated to monitor the activities and programs of nations deployed in space. To start over on the legal framework is a promising option, but the first option of amending the current Treaty is likely more feasible since it is a more incremental change. Thus, an amendment should be the first focus.

The United States has already begun to implement their own version of this with its Geosynchronous Space Situational Awareness Program.<sup>92</sup> This program includes a four-satellite mission run by the United States Air Force that began in 2014. The mission of the program is “to scour Earth's orbit for weaponized satellites capable of doing harm to satellites already in orbit” and to determine if a missile is successfully

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<sup>89</sup> *Id.*; see also Kuplic, *supra* note 14, at 1133–34 (comparing laws governing the high seas, Antarctica, and airspace with a potential legal framework for outer space).

<sup>90</sup> In order to use force in self-defense, it must be necessary and proportional. There may be further issues with pre-emptive self-defense in space as is already an issue on Earth now.

<sup>91</sup> Kuplic, *supra* note 14, at 1158.

<sup>92</sup> Lee Billings, *War in Space May Be Closer than Ever*, SCIENTIFIC AM. (Aug. 10, 2015), <https://www.scientificamerican.com/article/war-in-space-may-be-closer-than-ever>.

intercepted in space.<sup>93</sup> Thus, the technology is available to establish a monitoring system to ensure compliance with a new treaty. This system could provide greater stability and help convince nations to sign onto a new treaty in the first place. But, whether or not the United States would be willing to share this monitoring system is a big question.

### *B. The Feasibility of Progress*

For either of the two options above to be effective, they must have (a) “wide international acceptance,” (b) “incentives for state and private actors to use outer space,” and (c) “flexibility to adapt to changes in the international community.”<sup>94</sup> Unfortunately, many prior attempts to amend the Outer Space Treaty or form new treaties have been unsuccessful in obtaining such widespread international acceptance.<sup>95</sup> And, the United States has often been the most resistant when discussing these potential changes. The United States typically has not agreed to space amendments or treaties because it believes its sovereignty will be deteriorated by such agreements.<sup>96</sup> Also troubling for any attempt to change the current legal framework in space is the fact that “the United States has a track record of resisting agreements specifically designed to prevent an arms race in outer space.”<sup>97</sup>

It seems highly unlikely that the United States would sign onto anything that would restrict its ability to develop and test new space weaponry. But, the option to amend the Outer Space Treaty does not change much concerning space activity, rather it merely clarifies and codifies the current understanding of the spacefaring nations about the Outer Space Treaty. As more space incidents occur similar to the ones described in Part I and new space weapon technologies begin to be developed,<sup>98</sup> the United States may become more willing to begin discussions of reform.

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<sup>93</sup> Rich Smith, *U.S. Air Force Moves To Prevent Militarization of Space*, MOTLEY FOOL (Aug. 27, 2016, 12:13 PM), <http://www.fool.com/investing/2016/08/27/us-air-force-moves-to-prevent-militarization-of-sp.aspx>.

<sup>94</sup> Quinn, *supra* note 3, at 497.

<sup>95</sup> See *supra* Part II.2 concerning other attempts at international space treaties that failed to gain sufficient support from spacefaring nations.

<sup>96</sup> Kuplic, *supra* note 14, at 1160.

<sup>97</sup> *Id.*

<sup>98</sup> Some space weaponry currently being developed include kinetic energy ASAT capabilities; co-orbital ASAT capabilities, which “use a missile armed with explosives” to detonate when in close proximity to a target; directed energy capabilities, such as dazzlers, lasers, or high-powered microwave frequencies; “soft-kill” weapons, which disable rather than destroy; electromagnetic

A new treaty that includes a monitoring provision would be in the United States' best interest because it would provide stability in space while protecting American spacecraft and satellites. Yet, the United States may not trust the UN with this monitoring power and may feel more secure with its own current monitoring program. The United States has lost considerable faith in the UN concerning space activity, particularly after the UN failed to respond to a formal complaint filed by the United States regarding the Chinese ASAT weapon test but having the UN take no action in response.<sup>99</sup>

The United States remains significantly ahead of every other nation in the space race and the space arms race. It does not appear that the United States will take any new legal framework seriously until this advantage is threatened. Unfortunately, this is a dangerous approach to take. It might be wiser to lead the discussions regarding space law reform now, rather than to act after falling behind in the space race.

#### CONCLUSION

Space wars are no longer science fiction. Although it hasn't occurred yet, an arms battle in space may be imminent and has certainly become a genuine issue that the international community must come to terms with and address with a new legal framework in the near future. The current Outer Space Treaty no longer has any weight behind it and is continually losing clout as new space technology is being developed. The Treaty is further becoming obsolete as military, civilian, and commercial uses of spacecraft have merged and become interdependent. A new space law framework must be developed, either by amending the Outer Space Treaty or by creating a new space law treaty, and adopted by the broader international community to address these issues before space becomes a battlefield with no rules. Space is an indispensable resource for all nations to utilize. This new space law framework must find a balance between the interests in national security and the interests in keeping space available for exploration and research.<sup>100</sup> If outer space becomes a constant battlefield, nations will focus their efforts on developing capabilities and lose sight of scientific ones. Moreover, few will feel safe to invest in space technology that may be easily destroyed, and fewer still will feel safe to explore the vast unknowns of the final frontier.

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weaponry, such as a nuclear bomb; and space bombers. *See, e.g.,* Chanock, *supra* note 16, at 694; Kuplic, *supra* note 14, at 1137–39.

<sup>99</sup> *See* Quinn, *supra* note 3, at 476 (“The United States submitted a formal complaint; the United Nations took no action in response.”).

<sup>100</sup> *See id.* at 489 (“In place of granting space to all mankind, the treaty restricted space *from* all mankind and stunted space exploration.”).