

**WAR ON THE FINAL FRONTIER:  
CAN TWENTIETH-CENTURY SPACE LAW  
COMBAT TWENTY-FIRST-CENTURY  
WARFARE?**

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|      |   |     |
|------|---|-----|
| I.   | INTRODUCTION.....                                     | 237 |
| II.  | HISTORY OF SPACE AGREEMENTS .....                     | 239 |
| III. | SHORTCOMINGS OF THE CURRENT LEGAL REGIME ...          | 241 |
| IV.  | THE DEVELOPMENT OF ANTI-SATELLITE<br>TECHNOLOGY ..... | 243 |
| V.   | OTHER DEVELOPMENTS IN SPACE WEAPONRY.....             | 249 |
| VI.  | SPACE LAW AFTER THE OUTER SPACE TREATY .....          | 252 |
| VII. | CONCLUSION .....                                      | 259 |

I. INTRODUCTION

Moving into the 21st century, advances in technology have shifted the landscape of modern warfare, making space the next frontier for military exploitation.<sup>1</sup> Knowing the vital role space will play in the future of warfare, spacefaring nations have rushed to stake their claims in the vast beyond, hoping to obtain

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1. See Jackson Maogoto & Steven Freeland, *The Final Frontier: The Laws of Armed Conflict and Space Warfare*, 23 CONN. J. INT'L L. 165, 167-70 (2007) (discussing the current space threat and actions being taken to weaponize space by various countries).

their piece of the ultimate high ground.<sup>2</sup> However, much like the westward expansion of the United States, expansion into outer space is fraught with the dangers of lawlessness that could destabilize the global community and spark an international arms race.<sup>3</sup>

The battle for space began in the 1950s with the Soviet launch of Sputnik I (Sputnik), and since then there has been a manic race to gain space superiority.<sup>4</sup> The genesis of Sputnik ultimately culminated in the first treaty governing the use of space called the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, or commonly known as the Outer Space Treaty.<sup>5</sup>

Since the signing of the Outer Space Treaty in 1967, differing interpretations of the Outer Space Treaty have resulted in many different approaches in carrying out the treaty, rendering it almost powerless to ensure a non-militarized space.<sup>6</sup> Furthermore, with the technological advances made in the past 40 years, the potential use of space for strategic military

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2. See Meetings Coverage, General Assembly, Full-Spectrum Dominance of Outer Space Can Turn Frontier into 'Military Theatre', Build Walls of Suspicion, Breach Global Security, First Committee Told, U.N. Meetings Coverage GA/DIS/3464 (Oct. 23, 2012), <http://www.un.org/press/en/2012/gadis3464.doc.htm> [<http://perma.cc/X6BV-HG7L>] (pointing out that more than 130 countries either possessed sophisticated space programs or were developing them and using information from space assets for defense purposes).

3. See *id.* (commenting on how placing weapons in outer space would "build walls of distrust and suspicion" and result in the proliferation of less space-advanced countries seeking to acquire greater military ability in space).

4. NASA, *Sputnik and the Dawn of the Space Age* (Oct. 10, 2007), <http://history.nasa.gov/sputnik/> [<http://perma.cc/2TU9-73NU>]; see also Maogoto & Freeland, *supra* note 1 (describing modern attempts by the United States, Russia, and China to dominate space).

5. 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]; *The Outer Space Treaty Promised Peace in Space*, SEEKER (Oct. 10, 2013, 12:52 PM), <http://www.seeker.com/the-outer-space-treaty-promised-peace-in-space-1767936768.html> [<http://perma.cc/SZHP-S83N>] (characterizing Sputnik as the catalyst for various treaty negotiations between the United States and the U.S.S.R. that eventually resulted in the Outer Space Treaty).

6. See Blair Stephenson Kuplic, Comment, *The Weaponization of Outer Space: Preventing an Extraterrestrial Arms Race*, 39 N.C. J. INT'L L. & COM. REG. 1123, 1137 (2014) (discussing the shortcomings of the Outer Space Treaty and other international legislation in dealing with growing space threats).

advantages is a pressing threat to the global community that must be addressed in order to curb an extraterrestrial arms race.<sup>7</sup> Of particular concern is the testing of antisatellite weaponry, which, if used, could have a catastrophic impact on the global economy and current warfighter technology.<sup>8</sup> Over the last ten years, several new potential treaties and agreements have been proposed. However, because the countries with the greatest space capability recognize that space supremacy is what will be the ultimate factor in determining future military power, the current proposals have failed to materialize into an agreement of any real potential for international acceptance.<sup>9</sup>

This comment will explore the history of space agreements, the shortcomings of the current legal regime governing the international use of outer space, and document the space threats that have arisen as a result of the inadequate legal framework for dealing with a global community that is now far more technologically advanced than the time when the Outer Space Treaty was ratified. After identifying the current threats, this comment will discuss the most recent proposals to deal with the growing threats associated with space and point out key problems with any agreements currently in place. Lastly, this comment will try to identify potential solutions to these problems that could work to deter a devastating arms race that would destabilize the global community and potentially result in unnecessary conflict.

## II. HISTORY OF SPACE AGREEMENTS

The battle for space began in October 1957 after the Soviet's launch of Sputnik. The launch shocked the West, spreading alarm and prompting a space race that the global community hoped to temper with the creation of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS).<sup>10</sup> UNCOPUOS is

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7. *Id.* at 1137, 1158.

8. Robert G. Joseph, Under Sec'y for Arms Control & Int'l Sec., Remarks on the President's National Space Policy – Assuring America's Vital Interests (Jan. 11, 2007), <http://2001-2009.state.gov/t/us/rm/78679.htm> [<http://perma.cc/QP68-6SXW>].

9. See Kuplic, *supra* note 6, at 1157 (discussing the United States' resistance to measures meant to prevent arms race and denying existence of arms race).

10. G.A. Res 1472 (XIV) at 5 (Dec. 12, 1959); Kuplic, *supra* note 6, at 1128; Gregory Feifer, *Sputnik's Designers Didn't Fathom Its Impact*, NPR (Oct. 4, 2007, 11:47 AM), <http://>

the primary vehicle for negotiating multilateral agreements relating to outer space, and currently has 83 member states as of 2015, including the primary space players: the United States, China, and Russia.<sup>11</sup> The most important agreement reached through this body was the Outer Space Treaty.<sup>12</sup>

The Outer Space Treaty is the foundational space treaty that serves as the “constitution” for international space activity and provides the framework for the present day legal regime regulating outer space.<sup>13</sup> The Outer Space Treaty, entered into force on October 10, 1967, has been ratified by 89 countries, and was created for the purpose of fostering an environment of international cooperation in scientific and exploration endeavors in space.<sup>14</sup>

Aiming to foster an environment of mutual cooperation among participating nations, the Outer Space Treaty provides that the exploration and use of outer space “shall be carried out for the benefit and in the interest of all countries.”<sup>15</sup> Furthermore, the Outer Space Treaty establishes that outer space is free for exploration and scientific investigation by all States and the States shall facilitate and encourage international cooperation in

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[www.npr.org/templates/story/story.php?storyId=14949640](http://www.npr.org/templates/story/story.php?storyId=14949640) [<http://perma.cc/2PS9-A7MK>]; *COPUOS History*, UNITED NATIONS OFFICE OF OUTER SPACE AFFAIRS, <http://www.unoosa.org/oosa/en/ourwork/copuos/history.html> [<http://perma.cc/ZZ4P-CD8W>] (last visited August 7, 2016).

11. *Members of the Committee on the Peaceful Uses of Outer Space*, UNITED NATIONS OFFICE OF OUTER SPACE AFFAIRS, <http://www.unoosa.org/oosa/en/members/index.html> [<http://perma.cc/JMJ7-XXY7>] (last visited Nov. 7, 2015).

12. Outer Space Treaty, *supra* note 5; Kuplic, *supra* note 6, at 1128; Vladimír Kopal, *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, AUDIOVISUAL LIBRARY OF INT’L LAW 1, [http://legal.un.org/avl/pdf/ha/tos/tos\\_e.pdf](http://legal.un.org/avl/pdf/ha/tos/tos_e.pdf) [<http://perma.cc/NCF5-EXXG>] (last visited Nov. 7, 2015).

13. Kuplic, *supra* note 6, at 1128 (asserting that the Outer Space Treaty has served as the basic framework of outer space law and is referred to as the “constitution” and “Magna Carta” of outer space); Kopal, *supra* note 12 (stating that the Outer Space Treaty established the framework for the present outer space legal regime).

14. Outer Space Treaty, *supra* note 5; *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, United Nations Office for Disarmament Affairs, [http://disarmament.un.org/treaties/t/outer\\_space](http://disarmament.un.org/treaties/t/outer_space) [<http://perma.cc/4ESY-NKCD>] (last visited Oct. 23, 2016).

15. Outer Space Treaty, *supra* note 5, art. I.

these endeavors.<sup>16</sup>

Article IV of the Outer Space Treaty addresses the military use of space.<sup>17</sup> The provision states that the moon and other celestial bodies shall be used by all participating parties exclusively for peaceful purposes.<sup>18</sup> Further defining the contours of the provision, the Outer Space Treaty forbids the establishment of military bases on celestial bodies and does not allow celestial bodies to be used for testing of weapons of any type.<sup>19</sup> Article IV also addresses the nuclear weapon concern at the time of drafting, stating that States shall not place nuclear weapons or any other weapon of mass destruction in space in any manner.<sup>20</sup>

### III. SHORTCOMINGS OF THE CURRENT LEGAL REGIME

As ambitious and admirable as the Outer Space Treaty is in its attempt to secure the peaceful use of space, it is fraught with ambiguities that cripple its effectiveness and prevent it from carrying out its purposes in a time that needs it most.<sup>21</sup> Perhaps the biggest obstacle in maintaining a peaceful use of space is the term “peaceful purposes” in Article IV.<sup>22</sup> The Outer Space Treaty, along with other international space law treaties, fail to provide a conclusive definition of the term.<sup>23</sup>

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16. *Id.*

17. *Id.* art. IV.

18. *Id.*

19. *Id.*

20. Compare NASA, *supra* note 4 (commenting that the United States feared that the Soviets’ ability to launch Sputnik translated into the capability to launch ballistic missiles carrying nuclear weapons), with Outer Space Treaty, *supra* note 5, art. IV (providing that no Party can undertake placing in orbit any object carrying nuclear weapons or station such weapons in space in any other manner).

21. See Jonathan N. Halpern, Note, *Antisatellite Weaponry: The High Road to Destruction*, 3 B.U. INT’L L.J. 167, 177 (1985) (noting that there is no way to “reasonably conclude that the Treaty frees outer space from military intervention.”); Christopher M. Petras, “Space Force Alpha” – *Military Use of the International Space Station and the Concept of “Peaceful Purposes,”* 53 A.F. L. REV. 135, 168-72 (2002) (describing the difficulties involved in defining the meaning of “peaceful” as used in Article IV of the Outer Space Treaty).

22. Outer Space Treaty, *supra* note 5, art. IV; Petras, *supra* note 21, at 168.

23. Petras, *supra* note 21, at 168.

The initial interpretation of “peaceful purposes,” accepted by both the United States and the Soviet Union at the Outer Space Treaty’s inception, was “non-military.”<sup>24</sup> This “non-military” interpretation was supported by the fact that the phrase “peaceful purposes” in the Outer Space Treaty was derived from the 1959 Antarctic Treaty, which served as a significant model for the Outer Space Treaty.<sup>25</sup> Article I of the Antarctic Treaty states “Antarctica shall be used for peaceful purposes only.”<sup>26</sup> The Article’s subsequent sentence then prohibits the use of Antarctica for “any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military maneuvers, as well as the testing of any type of weapons.”<sup>27</sup> Because the Outer Space Treaty and the Antarctic Treaty use the same “peaceful purposes” language, it is plausible to assume that the “peaceful purposes” language in the Outer Space Treaty was designed to entail the Antarctic Treaty’s provision prohibiting the use of Antarctica for any use that is military in nature.<sup>28</sup>

Even though the Soviets maintained that all military activities in space were not peaceful and possibly unlawful, they continued to send military payloads into space and became increasingly dependent on space technology for military planning.<sup>29</sup> These actions by the Soviets ultimately prompted the United States to modify its interpretation of “peaceful purposes” from “non-military” to “non-aggressive.”<sup>30</sup> By interpreting “peaceful purposes” to mean “non-aggressive,” the United States was able to conduct activities in space so long as the activities did not violate Article 2 of the UN Charter which prohibits the “threat or use of force.”<sup>31</sup> As time progressed, the Soviets and other member states abandoned the initial interpretation of “peaceful purposes” through their space activities and lack of formal

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24. Inst. of Air & Space Law, “Peaceful” and Military Uses of Outer Space: Law and Policy 3 (2005) (background paper, McGill University).

25. Petras, *supra* note 21, at 168.

26. Antarctic Treaty art. I, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 71.

27. *Id.*

28. Petras, *supra* note 21, at 168.

29. *Id.* at 171.

30. *Id.* at 169-71.

31. U.N. Charter art. 2, para. 4.

protests regarding other countries' military use of space, demonstrating that space could be used for military purposes.<sup>32</sup> Currently, the meaning of "peaceful purposes" is generally accepted by the majority of member States to mean "non-aggressive," with the United States maintaining that all States possess the right to defend themselves against threats in outer space.<sup>33</sup>

#### IV. THE DEVELOPMENT OF ANTI-SATELLITE TECHNOLOGY

Within weeks of the Soviet's launch of Sputnik, the United States was already working on the first concepts of Anti-Satellite (ASAT) technology.<sup>34</sup> In the years since, Russia, China, and the United States have all participated in developing ASAT technologies, with India also expressing ambitions to develop an ASAT weapon.<sup>35</sup>

The threat of ASAT weapons has become an increasingly important issue as spacefaring countries have become increasingly dependent on satellite technology for critical sectors, like the military, economic, and energy sectors.<sup>36</sup> This increasing dependence on satellite technology has resulted in satellites becoming a prime target for military adversaries.<sup>37</sup>

However, while we have seen an evolution in satellite and counter-satellite technology in the years since Sputnik, the Outer Space Treaty has proven ineffective to deal with the growing

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32. Petras, *supra* note 21, at 169-71; see Kuplic, *supra* note 6, at 1157 (describing how the United States was unwilling to develop formal protest mechanisms within the United Nations).

33. Robert A. Ramey, *Armed Conflict on the Final Frontier: The Law of War in Space*, 48 A.F.L. REV. 1, 79 (2000).

34. David A. Koplow, *ASAT-isfaction: Customary International Law and the Regulation of Anti-Satellite Weapons*, 30 MICH. J. INT'L L. 1187, 1200-01 (2009).

35. LAURA GREGO, A HISTORY OF ANTI-SATELLITE PROGRAMS 1-2 (2012), [http://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/a-history-of-ASAT-programs\\_lo-res.pdf](http://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/a-history-of-ASAT-programs_lo-res.pdf) [<http://perma.cc/9XKR-F5S5>].

36. *Id.* at 1; Bob Silberg, *Bringing NASA Satellite Data Down to Earth*, NASA: ENERGY INNOVATIONS (May 4, 2015), <http://climate.nasa.gov/news/2271/bringing-nasa-satellite-data-down-to-earth/> [<http://perma.cc/TSF9-H6DC>].

37. Lolita C. Baldor, *Pentagon Strategy Stresses the Importance of Satellites*, WASH. POST (Feb. 21, 2011), <http://www.washingtonpost.com/wp-dyn/content/article/2011/02/20/AR2011022003484.html> [<http://perma.cc/HP3J-9MU7>].

ASAT problem and no new developments in international space law have materialized to deal with this growing threat to global stability.<sup>38</sup>

One of the primary problems preventing the Outer Space Treaty from effectively preventing the escalating problem of ASAT technology is that—regardless of whether a country adopts a “non-military” or “non-aggressive” view of “peaceful purposes”—countries can still employ the use of ASAT technology without violating the treaty.<sup>39</sup> Regarding the use of space other than the moon and other celestial bodies, the Outer Space Treaty only prohibits States from placing in orbit any objects carrying nuclear weapons or any other weapons of mass destruction.<sup>40</sup> An ASAT, however, falls under neither of these categories.<sup>41</sup> With regard to other military activity and the use of space, the Outer Space Treaty only requires that the moon and other celestial bodies must be used for peaceful purposes.<sup>42</sup> Countries can develop, and have developed, ground-based ASAT technologies that can fire anti-satellite weaponry from earth.<sup>43</sup> The failure of the Outer Space Treaty to address technologies such as ASATs has resulted in a glaring gap in the coverage of the Outer Space Treaty—it does not prevent the use of weapons in space that are not weapons of mass destruction and are not used on the moon or other celestial bodies.<sup>44</sup>

Countries have exploited this gap since 1963 when the

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38. See GREGO, *supra* note 35, at 3 (commenting on how the Outer Space Treaty does not explicitly prohibit deliberate attacks on satellites or prevent ASAT weapons tests); Philip Ball, *Time to Rethink the Outer Space Treaty*, NATURE (Oct. 4, 2007), <http://www.nature.com/news/2007/071004/full/news.2007.142.html> (describing the Outer Space Treaty's vulnerability and the need for its modernization).

39. Halpern, *supra* note 21, at 185-87.

40. Outer Space Treaty, *supra* note 5, art. IV, para. 1.

41. Halpern, *supra* note 21, at 186-87 (stating an ASAT is neither a nuclear weapon nor a weapon of mass destruction).

42. Outer Space Treaty, *supra* note 5, art. IV, para. 2.

43. See, e.g., GREGO, *supra* note 35, at 5-7 (documenting the development of anti-satellite ground-based laser systems by the Air Force and Navy in the late 1980s); Marc Kaufman & Dafna Linzer, *China Criticized for Anti-Satellite Missile Test*, WASH. POST (Jan. 19, 2007), <http://www.washingtonpost.com/wp-dyn/content/article/2007/01/18/AR2007011801029.html> [<http://perma.cc/G2GR-WYYC>] (reporting on China's recent ground-based anti-satellite missile test).

44. Halpern, *supra* note 21, at 180, 208.

Russians began initial testing on the Istrebitel Sputnikov (IS), a co-orbital anti-satellite weapon that intercepts orbiting satellites as they pass over the ASAT's launch site.<sup>45</sup> The IS is equipped with an onboard radar system that guides an interceptor within tens of meters of the target and detonates, damaging the satellite overhead with shrapnel.<sup>46</sup> In the years subsequent to the IS launches, the Russians have continued to develop and test ASAT technologies.<sup>47</sup> Perhaps most concerning to the international community was Russia's launch of the Kosmos 2499 in May 2014.<sup>48</sup>

The Russians launched the Kosmos 2499 stealthily, as part of a routine and innocuous Rodnik commsat launch, which customarily consisted of only three Rodnik satellites being launched.<sup>49</sup> However, after a May 2014 commsat launch, a fourth

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45. GREGO, *supra* note 35, at 3 (noting how Russia's ASAT system uses a co-orbital strategy, where a weapon with explosives is launched into the same orbit as the target satellite and moves to destroy it); Brian Weeden, *Through a Glass, Darkly: Chinese, American, and Russian Anti-Satellite Testing in Space*, SECURE WORLD FOUND. 1 (Mar. 17, 2014), [https://swfound.org/media/167224/through\\_a\\_glass\\_darkly\\_march2014.pdf](https://swfound.org/media/167224/through_a_glass_darkly_march2014.pdf) [<http://perma.cc/6YQ7-VSUS>] (noting how some U.S. sources believe that the rocket China launched from the Xichang Satellite Launch Center in 2013 was actually the test of a new ballistic missile); Anatoly Zak, *The Hidden History of the Soviet Satellite-Killer*, POPULAR MECHS. (Nov. 1, 2013), <http://www.popularmechanics.com/space/satellites/a9620/the-hidden-history-of-the-soviet-satellite-killer-16108970/> [<http://perma.cc/MR35-N49E>] (noting that the Soviet Union launched its first "killer satellite" in November 1963).

46. GREGO, *supra* note 35, at 3.

47. See, e.g., Weeden, *supra* note 45, at 31-32 (stating that during the mid-1980s, the Soviets developed a second co-orbital ASAT, "Naryad," that was capable of placing kill vehicles in orbits as high as around 24,000 miles).

48. See, e.g., Lee Billings, *War in Space May Be Closer Than Ever*, SCI. AM. (Aug. 10, 2015) <http://www.scientificamerican.com/article/war-in-space-may-be-closer-than-ever/> [<http://perma.cc/8PX7-NGJS>] (describing uncertainty amongst U.S. officials regarding the intentions behind the Kosmos 2499 test); Alan Boyle, *Russian Space Object 2014-28E Sparks Worries About "Satellite Killer,"* NBC NEWS (Nov. 18, 2014, 6:07 PM), <http://www.nbcnews.com/science/space/russian-space-object-2014-28e-sparks-worries-about-satellite-killer-n251111> [<http://perma.cc/XD3J-2KC9>] (commenting that the Russian launch of the Kosmos 2499 could rekindle international concerns of a Pearl Harbor attack in outer space)

49. David Axe, *Moscow Could Be Prepping for Space War with Aggressive New Satellites*, RED STAR RISING (July 23, 2015, 12:03 AM), <http://www.thedailybeast.com/articles/2015/07/23/moscow-could-be-prepping-for-space-war-with-spooky-new-satellites.html> [<http://perma.cc/6URW-5GX4>]; Emily Greenhouse, *In the Sky, the Sign of a New Cold War?*, BLOOMBERG, (Nov. 18, 2014, 1:17 PM), <http://www.bloomberg.com/politics/articles/2014-11-18/in-the-sky-the-sign-of-a-new-cold-war> [<http://perma.cc/EJ76-2CWT>].

object was detected that the United States initially classified as debris.<sup>50</sup> However, shortly thereafter, the United States observed the object making unusual maneuvers, including maneuvering into other orbits and rendezvousing with the rocket launching the satellite into orbit.<sup>51</sup> Some experts have hypothesized that the unidentified maneuvering object may be an inspector satellite.<sup>52</sup> An inspector satellite is a satellite that can maneuver close to other satellites in order to photograph, service, repair, or refuel a satellite in orbit.<sup>53</sup> However, inspector satellites could also potentially be used for more hostile purposes.<sup>54</sup> The concern with these maneuvering satellites is that they are able to maneuver dangerously close to other satellites, potentially leaving enemy satellites vulnerable to disabling and eavesdropping.<sup>55</sup>

ASAT capabilities such as those displayed by the Kosmos 2499 are especially concerning to the United States because the United States' modern military capabilities are highly dependent on satellite technology.<sup>56</sup> Compounding the threat to satellites is the fact that current U.S. satellites are relatively soft targets—they lack substantive ability to defend against attacks, leaving the United States highly susceptible to a debilitating satellite attack that would result in an enormous degradation of military

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50. Paul Rincon, *Russia Tests 'Satellite Catcher,'* BBC (Nov. 20, 2014), <http://www.bbc.com/news/science-environment-30097643/> [<http://perma.cc/S5LS-QREF>].

51. *Id.*

52. *Id.*; Sam Jones, *Object 2014-28E – Space Junk or Russian Satellite Killer?*, FIN. TIMES (Nov. 17, 2014, 6:17 PM), <http://www.ft.com/intl/cms/s/2/cdd0bdb6-6c27-11e4-990f-00144feabdc0.html#axzz3JQt27ncr> [<http://perma.cc/FJ2J-JJ5Q>] (speculating that the unidentified object may be capable of interacting with other satellites in either a peaceful or hostile manner).

53. Rincon, *supra* note 50; Jones, *supra* note 52.

54. See Rincon, *supra* note 50 (asserting that the technology in an inspector satellite could potentially be used as an anti-satellite weapon); see also Jones, *supra* note 52 (stating that the satellite could potentially be capable of conducting a cyber-attack or jamming communications).

55. See Rincon, *supra* note 50 (stating that a satellite inspector could eavesdrop or jam communications).

56. See Frank M. Walsh, *Forging a Diplomatic Shield for American Satellites: The Case for Reevaluating the 2006 National Space Policy in Light of Chinese Anti-Satellite System*, 72 J. AIR L. & COM. 759, 771 (2007) (explaining how satellites serve as the foundation for the modern networked American military by enabling it to “fuse its land-based conventional power projection capabilities with its space-based communications, navigation, and reconnaissance capabilities”).

capability.<sup>57</sup>

The Chinese have also been active in developing ASAT technology.<sup>58</sup> In 2007, China launched a ground-based missile into space that directly hit and destroyed an aging weather satellite.<sup>59</sup> This was particularly concerning because the test demonstrated that the Chinese had developed the capability of targeting U.S. spy satellites and space-based missile defense systems.<sup>60</sup>

More recently, in July 2014, China raised even greater global alarm after conducting what the United States believes was an ASAT test that resulted in a Chinese anti-satellite missile reaching geosynchronous orbit.<sup>61</sup> This test was of particular concern to the United States because geosynchronous orbit is where Air Force missile warning and nuclear command and control satellites are located.<sup>62</sup> If the satellites are now at risk, this would be a surprise to the U.S. military that had always believed there was no significant threat to those satellites.<sup>63</sup> The Chinese test was just one of six conducted over the past nine years

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57. See Koplow, *supra* note 34, at 1200 (noting that satellites make “excellent targets” because they are few in number, travel in predictable orbital paths, lack the ability to defend themselves from attack, and are expensive).

58. Weeden, *supra* note 45, at 1, 17; see Mike Gruss, *Space Command Chief Weighs in on Chinese Anti-Satellite Threat*, SPACENEWS (Feb. 24, 2015), <http://spacenews.com/space-command-chief-weighs-in-on-chinese-anti-satellite-threat/> [<http://perma.cc/WQ43-D4AS>] (expressing concerns about ongoing Chinese ASAT development).

59. Kaufman & Linzer, *supra* note 43.

60. See *id.* (commenting on the vulnerability of U.S. satellites in the wake of an ASAT that could reach regions of space home to U.S. spy satellites and missile defense systems); Richard Spencer, *Chinese Missile Destroys Satellite in Space*, TELEGRAPH (Jan. 19, 2007, 2:17 PM) <http://www.telegraph.co.uk/news/worldnews/1539948/Chinese-missile-destroys-satellite-in-space.html> (reporting that the United States, Japan, Australia, and Britain expressed concern over the Chinese missile launch).

61. Bill Gertz, *China Tests Anti-Satellite Missile: New ASAT Interceptor Threatens U.S. Spy Satellites*, WASH. FREE BEACON (Nov. 9, 2015, 5:00 AM), <http://freebeacon.com/national-security/china-tests-anti-satellite-missile/> [<http://perma.cc/UWZ3-NPHC>]; Frank Rose, Assistant Sec’y, Bureau of Arms Control, Verification & Compliance, Ballistic Missile Defense and Strategic Stability in East Asia (Feb. 20, 2015), <http://www.state.gov/t/avc/rls/2015/237746.htm> [<http://perma.cc/32DK-KS8Q>].

62. Gruss, *supra* note 58.

63. David Martin, *The Battle Above*, CBS NEWS (Apr. 26, 2015), <http://www.cbsnews.com/news/rare-look-at-space-command-satellite-defense-60-minutes-2/> [<http://perma.cc/3LBU-N4QY>].

and is viewed as part of a continuing effort by China to attain military dominance at sea and in the air.<sup>64</sup>

The United States has also been involved heavily in developing ASAT technology.<sup>65</sup> In June 1982, the United States announced that it would be developing an ASAT weapon that could be launched by an F-15.<sup>66</sup> By launching from an F-15, the United States could attack satellites in orbit without the limitations of ground based ASATs that require the target satellite's orbital plane to be overhead.<sup>67</sup> In 1985, the United States tested this new ASAT technology by destroying an aging satellite orbiting at an altitude of 555 km.<sup>68</sup>

U.S. interest in ASAT capabilities reemerged in the early 2000s when the United States began deploying satellite jamming systems and fielding missile defense interceptors with the ability to target most low-orbiting satellites, even proposing a space-based missile defense system that would have likely contained ASAT capability.<sup>69</sup> During the Bush administration, funding was increased to develop space technologies that would give the United States greater ability to track space objects, create new launch and propulsion technologies, and provide high-energy laser technologies.<sup>70</sup> This increased emphasis on space technology development resulted in the United States gaining significant capability in satellite jamming, satellite maneuvering, and ground-based lasers that have the ability to hit satellites in orbit and damage or blind the satellites, inhibiting

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64. Brian Bremner, *As China Stalks Satellites, U.S. and Japan Prepare to Defend Them*, BLOOMBERG (July 17, 2014), <http://www.bloomberg.com/news/articles/2014-07-17/u-dot-s-dot-japan-prepare-to-defend-satellites-from-chinese-attack> [http://perma.cc/H58C-76UG].

65. See Alex B. Englehart, *Common Ground in the Sky: Extending the 1967 Outer Space Treaty to Reconcile U.S. and Chinese Security Interests*, 17 PAC. RIM L. & POL'Y J. 133, 134-37, 154-55 (2008) (suggesting that a comprehensive ban on all space weapons would be unacceptable to the United States due to its heavy investment in various types of military support satellites, including ASAT technology); see also GREGO, *supra* note 35 at 1-2, 4, 8 (summarizing the United States' history in developing ASAT technologies).

66. GREGO, *supra* note 35, at 4.

67. *Id.* at 4-5.

68. *Id.* at 5.

69. *Id.* at 8-11.

70. *Id.* at 8.

satellite functioning during the early part of the 21st century.<sup>71</sup>

One of the most recent developments in ASAT capabilities is the development of the X-37B mini-shuttle by the United States.<sup>72</sup> The X-37B is a top secret, unmanned space plane operated by the U.S. Air Force and has been launched into orbit at least twice, staying in orbit for close to a year.<sup>73</sup> The Air Force has kept the purpose and payloads of the spacecraft secret, leading to criticism that the Air Force's silence could perpetuate a space arms race.<sup>74</sup> Speculation about the X-37B's actual intended purposes includes such purposes as space bombing, including the use of nuclear weapons, deploying spy satellites, and interfering with other satellites.<sup>75</sup>

## V. OTHER DEVELOPMENTS IN SPACE WEAPONRY

Currently, the United States is the global leader in the race to capitalize on new military technologies in space.<sup>76</sup> Because of the United States' current space technology superiority, other large global powers, such as China and Russia, have begun to aggressively pursue military space programs to limit the advantage enjoyed by the United States.<sup>77</sup> Due to the increase in spending among major global powers, a plethora of new technologies are being developed that could have a devastating

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71. *Id.* at 9-11.

72. See Michael Listner, *The X-37B Program: An American Exercise in the Art of War?*, SPACE REVIEW (Jan. 5, 2015), <http://www.thespacereview.com/article/2670/1> [<http://perma.cc/F24F-BNNG>] (discussing the launches of X-37B space crafts in 2010, 2011, and 2014, and the capability of the X-37B to serve as a potential anti-satellite weapon).

73. Sharon Weinberger, *X-37B: Secrets of the US Military Spaceplane*, BBC (Nov. 18, 2014), <http://www.bbc.com/future/story/20121123-secrets-of-us-military-spaceplane> [<http://perma.cc/QS2B-3G4B>].

74. Philip Swarts, *X-37B Space Plane is Shrouded in Mystery*, A.F. TIMES (Sept. 26, 2015, 11:06 AM), <http://www.airforcetimes.com/story/military/tech/2015/09/26/x-37b-space-plane-shrouded-mystery/72752826/> [<http://perma.cc/3QBF-4BCL>].

75. Listner, *supra* note 72.

76. Billings, *supra* note 48; Mike Wall, *China's Space Advances Worry US Military*, SPACE.COM, (Feb. 28, 2016, 10:21 AM), <http://www.space.com/14697-china-space-program-military-threat.html> [<http://perma.cc/EYG7-VEGT>].

77. Billings, *supra* note 48; see also Wall, *supra* note 76 (explaining that China is mounting a genuine threat to the United States' space dominance and that both Russia and China continue to progress in developing systems and technologies that may interfere with or disable various U.S. satellites).

effect on global stability.<sup>78</sup> Some of the dangerous new technologies prompting international concern include kinetic energy and hypervelocity weapons, particle beam weapons, and electromagnetic and radiation weapons.<sup>79</sup>

Kinetic energy weapons use physical objects shot from Earth with the intent of intercepting space targets by colliding with the target in a high speed impact.<sup>80</sup> Kinetic weapons have historically been the most common form of space weaponry, but resulting debris lingering in space for long periods of time after a kinetic weapon destroys a target has resulted in kinetic weapons being an undesirable method for destroying space targets.<sup>81</sup> Seeking to mitigate the space shrapnel problem, the United States began developing the KE-ASAT (kinetic energy ASAT) in 1989.<sup>82</sup> The KE-ASAT is unique to previous kinetic energy ASATs in that it incorporated the use of a mylar shroud to limit the amount of space debris.<sup>83</sup>

Another concerning technology involving kinetic energy is the development of hypervelocity rod bundles of tungsten cylinders commonly known as “Rods from God.”<sup>84</sup> These rods, launched into space and fired from satellites, would have the ability to hit a target anywhere on Earth with 15 minutes notice and the

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78. See Chris Buckley, *America Blamed for Space Arms Race*, SYDNEY MORNING HERALD (June 3, 2008), [http://www.smh.com.au/news/world/america-blamed-for-space-arms-race/2008/06/02/1212258741812.html?s\\_cid=rss\\_world](http://www.smh.com.au/news/world/america-blamed-for-space-arms-race/2008/06/02/1212258741812.html?s_cid=rss_world) (discussing China's aggressive effort in honing its ability to shoot down satellites and concerns that outer space will become a stage for struggle between countries); Billings, *supra* note 48 (detailing how the Obama administration budgeted over \$5 billion to be spent in the next five years to enhance the capabilities of the military space program).

79. Ramey, *supra* note 33, at 21-22 (discussing the dangers of kinetic and hypervelocity weapons, particle beam weapons, and electromagnetic and radiation weapons).

80. Robert David Onley, *Death from Above? The Weaponization of Space and the Threat to International Human Law*, 78 J. AIR. L & COM. 739, 746 (2013).

81. Ramey, *supra* note 33, at 22; *Outer Space: Militarization, Weaponization, and the Prevention of an Arms Race*, WOMEN'S INT'L LEAGUE OF PEACE & FREEDOM, <http://www.reachingcriticalwill.org/resources/fact-sheets/critical-issues/5448-outer-space> [<http://perma.cc/TDC8-MDB6>].

82. Dwayne A. Day, *Killer Birdie*, SPACE REV. (Mar. 31, 2008), <http://www.thespacereview.com/article/1093/1> [<http://perma.cc/W9F8-PB4C>].

83. *Id.*

84. Jonathan Shainin, *Rods from God*, N.Y. TIMES (Dec. 10, 2006), [http://www.nytimes.com/2006/12/10/magazine/10section3a.t-9.html?\\_r=0](http://www.nytimes.com/2006/12/10/magazine/10section3a.t-9.html?_r=0).

capability of penetrating deep into the earth without any explosives.<sup>85</sup> While physicists have noted problems with the program, including the lifting of heavy tungsten rods into orbit, the Air Force has displayed interest in further developing the technology, as evidenced by the inclusion of the project in the Air Force's "Transformation Flight Plan" of future system concepts.<sup>86</sup>

Particle beam weapons are directed energy weapons that deliver a high-energy current at the speed of light. They destroy targets by transferring thermal energy to the target like a lightning bolt.<sup>87</sup> The United States has been engaged in developing particle beam technology since as early as 1958, when the United States tested the use of particle beams for ballistic missile defense.<sup>88</sup> Today, weaponized use of particle beams still requires significant technological gains across a multitude of difficult areas, but if successfully completed, particle beam technology could provide significant space advantages in warfare.<sup>89</sup> Particle beam technology can be used to quickly strike anywhere in the world regardless of weather conditions, giving the possessing country a sizable military advantage, particularly in time-urgent military engagements.<sup>90</sup>

Electromagnetic and radiation weapons, such as nuclear bombs and electromagnetic pulse weapons, also pose a significant threat as the world becomes more space warfare oriented.<sup>91</sup> A nuclear weapon detonated in space presents far less consequences than traditional methods of atmospheric deployment. First,

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85. *Id.*; Englehart, *supra* note 65, at 136.

86. Shainin, *supra* note 84.

87. Ramey, *supra* note 33 at 25-26.

88. Richard Roberds, *Introducing the Particle-Beam Weapon*, AIR U. REV., July-Aug. 1984, <http://www.airpower.maxwell.af.mil/airchronicles/aureview/1984/jul-aug/roberds.html> [<http://perma.cc/PHP6-B9WL>].

89. *Id.*; see Leonard David, *Beam Weapons Almost Ready for Battle*, NBC NEWS (Jan. 11, 2006, 12:10 PM), [http://www.nbcnews.com/id/10805240/ns/technology\\_and\\_science-space/t/beam-weapons-almost-ready-battle/](http://www.nbcnews.com/id/10805240/ns/technology_and_science-space/t/beam-weapons-almost-ready-battle/) [<http://perma.cc/HXM5-VV7V>] (describing both the potential benefits of directed-energy weapons and the current limitations in research and development that prevent their implementation).

90. Ramey, *supra* note 33, at 25-26; Roberds, *supra* note 88.

91. See CLAY WILSON, CONG. RESEARCH SERV., RL32544, HIGH ALTITUDE ELECTROMAGNETIC PULSE (HEMP) AND HIGH POWER MICROWAVE (HPM) DEVICES: THREAT ASSESSMENTS 8 (2004) (reporting that an EMP attack may create an incentive for other countries to develop or acquire nuclear capability).

because of the vacuum conditions in space, the nuclear blast transmits far less radiation and heat than it would with traditional deployment.<sup>92</sup> Because the shockwaves, torrential winds, and extreme heat resulting from a nuclear explosion within the atmosphere do not occur in space, the bomb's after-effects are relatively easy to confine to target locations.<sup>93</sup>

The primary threat associated with a high-altitude electromagnetic pulse attack, such as a nuclear weapon being detonated high above the Earth's surface, is a resulting gamma-radiation interaction with the atmosphere that would create an electromagnetic energy field that would devastatingly damage electronic equipment.<sup>94</sup> As an electromagnetic pulse radiates outwards, spanning distances up to thousands of miles, catastrophic damage would be incurred by computer circuitry, vehicles, communications equipment, and the nation's electricity grid.<sup>95</sup>

## VI. SPACE LAW AFTER THE OUTER SPACE TREATY

In addition to the adoption of the Outer Space Treaty in 1967, there have been four space treaties adopted and a series of arms control treaties promulgated to govern the growing problems associated with spacefaring nations' increasing ability to utilize space.<sup>96</sup> The treaties that elaborate the Outer Space Treaty include: the Astronaut Rescue Agreement of 1968, requiring the safe return of astronauts to their home country; the Liability Convention of 1972, establishing methods to determine liability when a country damages or destroys space objects belonging to another country; the Registration Convention of 1976, requiring countries to log in a registry what space objects the country is launching into space; and the Moon Agreement of 1984,

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92. Ramey, *supra* note 33, at 19.

93. *Id.* at 19-20.

94. WILSON, *supra* note 91, at 3.

95. *Id.*; Sharon E. Burke & Emily Schneider, *Who's Afraid of the Big Bad Pulse?*, SLATE (July 2, 2015, 11:54 AM), [http://www.slate.com/articles/technology/future\\_tense/2015/07/emp\\_threats\\_could\\_an\\_electro\\_magnetic\\_pulse\\_weapon\\_wipe\\_out\\_the\\_power\\_grid.html](http://www.slate.com/articles/technology/future_tense/2015/07/emp_threats_could_an_electro_magnetic_pulse_weapon_wipe_out_the_power_grid.html) [<http://perma.cc/D8E3-ENCU>].

96. Nina Tannenwald, *Law Versus Power on the High Frontier: The Case for a Rule-Based Regime for Outer Space*, 29 YALE J. INT'L L. 363, 370 (2004).

reaffirming and elaborating on the Outer Space Treaty's position that the moon and other celestial bodies are to be exclusively used for peaceful purposes.<sup>97</sup>

Arms control treaties also adopt additional limitations on the military use of space.<sup>98</sup> The Strategic Arms Limitation Talks (SALT I) were the first substantial arms control agreements between the United States and the Soviet Union.<sup>99</sup> The SALT I discussions culminated in the Anti-Ballistic Missile Treaty in 1972.<sup>100</sup> The treaty did not allow the development, testing, or deployment of sea, air, space, or mobile land-based anti-ballistic systems or components in an attempt to control the nuclear arms race.<sup>101</sup> After thirty years of the Anti-Ballistic Missile Treaty being in effect, the United States withdrew from the treaty in 2002, claiming it prevented the United States from developing defenses against possible terrorist attacks and rogue-state ballistic missile attacks.<sup>102</sup>

Part of the SALT I agreement was a provision stipulating that the parties begin further negotiations to limit strategic offensive arms.<sup>103</sup> Hence, SALT II was formed.<sup>104</sup> This agreement, set to

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97. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119; Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187; Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, July 11, 1984, 1363 U.N.T.S. 3; *International Legal Agreements Relevant to Space Weapons*, UNION OF CONCERNED SCIENTISTS, [http://www.ucsusa.org/nuclear-weapons/space-weapons/international-legal-agreements#.Vo\\_rF7YrIdU](http://www.ucsusa.org/nuclear-weapons/space-weapons/international-legal-agreements#.Vo_rF7YrIdU) [http://perma.cc/6JRE-W2L3] (last visited Oct. 24, 2016).

98. Tannewald, *supra* note 96, at 376.

99. *SALT Treaties*, THE OXFORD COMPANION TO AMERICAN MILITARY HISTORY (John Whiteclay Chambers ed. 2004), <http://www.oxfordreference.com/view/10.1093/acref/9780195071986.001.0001/acref-9780195071986-e-0808> [http://perma.cc/69G8-B862].

100. Treaty on the Limitation of Anti-Ballistic Missile Systems, U.S.-U.S.S.R., May 26, 1972, 23 U.S.T. 3435.

101. *Id.* art. V.

102. Terence Neilan, *Bush Pulls Out of AMB Treaty; Putin Calls Move a Mistake*, N.Y. TIMES (Dec. 13, 2001), <http://www.nytimes.com/2001/12/13/international/bush-pulls-out-of-abm-treaty-putin-calls-move-a-mistake.html>.

103. Treaty on the Limitation of Anti-Ballistic Missile Systems, *supra* note 100, art. XI.

104. U.S. DEPT OF STATE, *Treaty Between the United States of America and the*

expire on either December 31, 1985 or upon the creation of a new agreement, was primarily crafted to control arms on land, but included prohibitions against developing, testing, or deploying weapons of mass destruction in space.<sup>105</sup>

Even with the additional development of space and arms control treaties since the Outer Space Treaty, international law is still woefully inadequate to deal with challenges posed by the increased use of space for military purposes.<sup>106</sup> Due to the lack of law sufficient to curb this ever-growing space threat, new frameworks have been proposed to fill the glaring void.<sup>107</sup>

Two approaches were recently proposed to solve the militarized space problem, one by the United States and the other by Russia and China.<sup>108</sup> In February 2008, China and Russia put forward the Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects (PPWT).<sup>109</sup> The proposed treaty would be an internationally binding agreement outlawing weaponization in space.<sup>110</sup> The United States quickly refused the 2008 PPWT

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*Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms (SALT II)*, BUREAU OF ARMS CONTROL, VERIFICATION, & COMPLIANCE, <http://www.state.gov/t/isn/5195.htm> [<http://perma.cc/2DAY-L4HV>] (last visited Nov. 6, 2016).

105. *Id.* art. XIX; *see also* Tannenwald, *supra* note 96, at 370 n.28 (noting SALT II's prohibition on the development, testing, or deploying of weapons of mass destruction in space).

106. Tannenwald, *supra* note 96; *see also* Maogoto & Freeland, *supra* note 1, at 170, 195 (describing the difficulties applying the Laws of Armed Conflict to military use of space).

107. *See, e.g.*, Bill Gertz, *U.S. Opposes New Draft Treaty from China and Russia Banning Space Weapons*, WASH. FREE BEACON (June 19, 2014, 5:00 AM), <http://freebeacon.com/national-security/u-s-opposes-new-draft-treaty-from-china-and-russia-banning-space-weapons/> [<http://perma.cc/ZVU5-NULF>] (commenting on the Treaty on the Prevention of the Placement of Weapons in Outer Space and its proposed code of conduct); *Code of Conduct for Outer Space Activities*, EUROPEAN UNION, [http://eeas.europa.eu/headquarters/headquarters-homepage/8466/outer-space-activities\\_en](http://eeas.europa.eu/headquarters/headquarters-homepage/8466/outer-space-activities_en) [<http://perma.cc/9WW7-QF5P>] (last visited Oct. 24, 2016).

108. Gertz, *supra* note 107.

109. *Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects (PPWT)*, COUNCIL ON FOREIGN RELATIONS (2008), <http://www.cfr.org/space/treaty-prevention-placement-weapons-outer-space-threat-use-force-against-outer-space-objects-ppwt/p26678> [<http://perma.cc/9DMF-BYQ6>].

110. *Id.*

because the United States believed it was impossible to enforce and were suspicious that the proposal was a ploy by Russia and China to gain a military advantage.<sup>111</sup>

In 2014, Russia and China presented a new draft of the PPWT in order to provide countries with an updated version of the 2008 proposal for consideration.<sup>112</sup> However, much like the first draft, the United States found insurmountable shortcomings with the updated treaty.<sup>113</sup> After conducting an in-depth review of the revised treaty, the United States claimed the treaty lacked sufficient verification methods, did not restrict ASAT weapon development, and did not address the most pressing current issue of ground-based ASAT systems.<sup>114</sup>

The updated treaty also does not provide any measure to prevent a country from having “breakout” capability.<sup>115</sup> Breakout capability means that a country can develop, test, and store weapons that would break the treaty if ever used, but the actual developing, testing, and storing of the weapons themselves is not a violation of the treaty.<sup>116</sup> Therefore, a country that decides at some point to break the treaty could already have the weaponry on hand and ready for deployment.<sup>117</sup> The failure of the treaty to address this issue is a problem because the treaty provides no real

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111. Nick Cumming-Bruce, *U.N. Weighs a Ban on Weapons in Space, but U.S. Still Objects*, N.Y. TIMES (Feb. 13, 2008), <http://www.nytimes.com/2008/02/13/world/europe/13arms.html>.

112. Michael Listner & Rajeswari Pillai Rajagopalan, *The 2014 PPWT: A New Draft but with the Same and Different Problems*, SPACE REV. (Aug. 11, 2014), <http://www.thespacereview.com/article/2575/1> [<http://perma.cc/36JZ-H98E>].

113. Jeff Foust, *U.S. Dismisses Space Weapons Treaty Proposal as “Fundamentally Flawed,”* SPACE NEWS (Sept. 11, 2014), <http://spacenews.com/41842us-dismisses-space-weapons-treaty-proposal-as-fundamentally-flawed/> [<http://perma.cc/NUJ4-CABD>].

114. Ambassador Robert A. Wood, Representative to the Conference on Disarmament, U.S. Perspectives on the Opportunities and Challenges of Nuclear Disarmament (Dec. 17, 2014), <https://geneva.usmission.gov/2014/12/17/ambassador-robert-wood-u-s-perspectives-on-the-opportunities-and-challenges-of-nuclear-disarmament/> [<http://perma.cc/5GBE-U6A9>].

115. See Listner & Rajagopalan, *supra* note 112 (noting that the 2014 draft does not address “breakout” weapons).

116. P.J. Blount & Andrew Taylor, *U.S. Problems with the Draft PPWT*, UNIV. OF MISS. SCH. OF LAW: RES COMMUNIS (July 24, 2012, 3:15 PM), <http://rescommunis.olemiss.edu/2012/07/24/u-s-problems-with-the-draft-ppwt/> [<http://perma.cc/3ZFS-F7T9>].

117. *Id.*

way to stop the development and stockpiling of weapons, and so does not prevent a perpetuating arms race.<sup>118</sup>

The United States' position on outer space arms control proposals is that it will not join an agreement that is not equitable, effectively verifiable, and that does not enhance the security of all.<sup>119</sup> Finding that Russia and China's proposed treaty does not satisfy these requirements, the United States rejected it and instead has favored establishing an international code of conduct to deal with the space weapon threat.<sup>120</sup>

The International Code of Conduct for Outer Space Activities was proposed by the EU following the adoption of two UN General Assembly Resolutions.<sup>121</sup> The first resolution in 2006 called for member states to submit concrete proposals to increase transparency and create confidence between nations in outer space activities to maintain international peace and security and prevent an arms race in outer space.<sup>122</sup> The second resolution, adopted in 2008, continued the goal of the first resolution by again inviting members to submit proposals to the UN Secretary General for review.<sup>123</sup>

The preliminary draft of the International Code of Conduct for Outer Space Activities was released in December 2008, with a more recent draft released in March 2014.<sup>124</sup> The preamble to the Code of Conduct states that the Code is designed to safeguard a peaceful and sustainable use of outer space for now and the future, and recognizes the importance of preventing an arms race

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118. Ambassador Robert A. Wood, Representative to the Conference on Disarmament, Ensuring the Long-Term Sustainability and Security of the Space Environment (Sept. 9, 2014), <https://geneva.usmission.gov/2014/09/09/ambassador-robert-wood-ensuring-the-long-term-sustainability-and-security-of-the-space-environment/> [<http://perma.cc/9C36-UNEU>].

119. Frank A. Rose, Deputy Assistant Sec'y of State for Arms Control, Verification, & Compliance, Continuing Progress on Ensuring the Long-Term Sustainability and Security of the Space Environment (June 10, 2014), <http://www.state.gov/t/avc/rls/2014/227370.htm> [<http://perma.cc/SX3Z-XS8D>].

120. *Id.*

121. *Code of Conduct for Outer Space Activities*, *supra* note 107.

122. G.A. Res. 61/75, ¶ 1, U.N. Doc. A/RES/61/75 (Dec. 18, 2006).

123. G.A. Res. 62/43, ¶ 2 U.N. Doc. A/RES/62/43 (Jan. 8, 2008).

124. *Code of Conduct for Outer Space Activities*, *supra* note 107.

in outer space.<sup>125</sup>

The Code of Conduct is a pragmatic way for the international community to establish “rules of the road” for the use of space and aims to create an international culture of transparency and trust when it comes to the use of space.<sup>126</sup> However, the Code of Conduct solution is not without opposition among spacefaring nations.<sup>127</sup> At a meeting in July 2015, Russia, China, Brazil, India, and South Africa all expressed their dissatisfaction with the Code as a means to effectively prevent an arms race in outer space.<sup>128</sup> These countries’ key concerns with the Code were that the Code does not include mandates for military issues in space, and that the code reinforces that countries have an inherent right to use self-defense in space.<sup>129</sup> Some countries believe the right to self-defense will be a loophole exploited by countries to weaponize space, and there are also concerns about the non-legal status of the Code.<sup>130</sup> Developing nations, including nations in Africa and Latin America, have raised concerns that the International Code of Conduct would be drafted by current spacefaring nations in a manner that would prevent their expansion into space.<sup>131</sup>

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125. *Draft International Code of Conduct for Outer Space Activities*, at 1, COM (2014) (Mar. 31, 2014), [https://eeas.europa.eu/sites/eeas/files/space\\_code\\_conduct\\_draft\\_vers\\_31-march-2014\\_en.pdf](https://eeas.europa.eu/sites/eeas/files/space_code_conduct_draft_vers_31-march-2014_en.pdf) [<http://perma.cc/NM8R-RJGM>].

126. *Code of Conduct for Outer Space Activities*, *supra* note 107.

127. Michael J. Listner, *Geopolitical Challenges to Implementing the Code of Conduct for Outer Space Activities*, E-INT’L RELATIONS (June 26, 2012), <http://www.e-ir.info/2012/06/26/geopolitical-challenges-to-implementing-the-code-of-conduct-for-outer-space-activities/> [<http://perma.cc/74PX-H9NT>].

128. Michael Krepon, *Space Code of Conduct Mugged in New York*, ARMS CONTROL WONK (Aug. 4, 2015), <http://www.armscontrolwonk.com/archive/404712/space-code-of-conduct-mugged-in-new-york/> [<http://perma.cc/2ZDB-A62V>].

129. *Id.*; see also Gabriella Irsten, *The Consultation Process for the International Code of Conduct for Outer Space Activities Ends*, REACHING CRITICAL WILL, <http://reachingcriticalwill.org/news/latest-news/8907-the-consultation-process-for-the-international-code-of-conduct-for-outer-space-activities-ends> [<http://perma.cc/8LPD-H7FC>] (last visited Aug. 7, 2016) (presenting opposing arguments against the Code of Conduct, including the argument that because the code is voluntary, it belongs in UN discussions on transparency and confidence building measures).

130. Irsten, *supra* note 129.

131. Akshan de Alwis, *New Tensions on How to Regulate Outer Space*, DIPLOMATIC COURIER (Aug. 10, 2015), <http://www.diplomaticcourier.com/2015/08/10/new-tensions-on-how-to-regulate-outer-space/> [<http://perma.cc/6EVE-DDG6>].

Ultimately, the meeting ended with the EU conceding that negotiations must be pursued in the context of a UN General Assembly mandate, which effectively killed the idea of an international code for the present time.<sup>132</sup>

The international political developments involved with the growing global space threat have failed to provide any real advancement to solving the problem of a looming arms race in space.<sup>133</sup> With the United States' concern over China and Russia's possible use of lawfare as a military strategy, agreements between the countries may prove difficult to procure in the future.<sup>134</sup> Lawfare is the misuse and abuse of legal systems in order to control adversaries by hamstringing them to accomplish one's military objectives.<sup>135</sup> The Chinese often refer in their writings to three types of interrelated warfare that are often deployed in coordinated strategic efforts to gain military advantages: (1) public opinion warfare—an ongoing effort to influence people's perceptions and attitudes through the media, press, movies, television, and books; (2) psychological warfare—efforts seeking to influence the minds of both civilians and the military, in both peace and war, and to weaken opponents to make them susceptible to coercion,<sup>136</sup> and (3) legal warfare—a

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132. Michael J. Listner, *The International Code of Conduct: Comments on Changes in the Latest Draft and Post-Mortem Thoughts*, SPACE REV. (Oct. 26, 2015), <http://www.thespacereview.com/article/2851/1> [<http://perma.cc/V739-WVF3>].

133. See Cumming-Bruce, *supra* note 111 (“We’re at a rather decisive point where we either move onto substantive negotiations or back to more years of fruitless discussion”); Paul Meyer, *Star Crossed: An International Code of Conduct for Outer Space?*, OPEN CAN. (Aug. 31, 2015), <http://www.opencanada.org/features/star-crossed-an-international-code-of-conduct-for-outer-space/> [<http://perma.cc/2LMK-PWSM>] (noting that due to opposition, the EU was unable to receive endorsements for their draft code of conduct).

134. See Gertz, *supra* note 107 (observing the potential difficulties that may arise from China and Russia's push for a legally binding space arms treaty).

135. DEAN CHENG, WINNING WITHOUT FIGHTING: CHINESE LEGAL WARFARE (May 21, 2012), <http://www.heritage.org/research/reports/2012/05/winning-without-fighting-chinese-legal-warfare> [<http://perma.cc/98GA-KXP9>]; *What is Lawfare*, LAWFARE PROJECT, <http://thelawfareproject.org/lawfare/what-is-lawfare-1/> [<http://perma.cc/V4A9-8DYU>] (last visited Oct. 24, 2016).

136. DEAN CHENG, WINNING WITHOUT FIGHTING: THE CHINESE PSYCHOLOGICAL WARFARE CHALLENGE (July 11, 2013), <http://www.heritage.org/research/reports/2013/07/winning-without-fighting-the-chinese-psychological-warfare-challenge> [<http://perma.cc/A29Z-2B3C>].

military operation, conducted under a unified command structure, that uses the law to conduct offensive, defensive, and counterattacking military operations.<sup>137</sup> These three types of warfare were explicitly implemented as part of China's "Political Work Regulations of the Chinese People's Liberation Army," a regulation directing the General Political Department to undertake the three warfares when implementing its political work.<sup>138</sup> Chinese writings on the use of lawfare also stress that the focus of legal warfare is to obtain military objectives, not legal objectives.<sup>139</sup>

## VII. CONCLUSION

The militarization of space is a real threat that is no longer a problem to be dealt with decades in the future.<sup>140</sup> Global stability is at risk now as a growing number of countries gain spacefaring capabilities and major space players across the globe itch to use newfound technology to gain the military advantages that accompany dominating space.<sup>141</sup> Many U.S. military and political leaders believe that the use of space for military purposes is an inevitable fact that will be realized sometime in the near future.<sup>142</sup>

This grim picture of an inevitable and dangerous arms race

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137. Cheng, *supra* note 135 (discussing the integral part that lawfare plays in China's military strategy).

138. *Id.*

139. *Id.*; see also Bill Gertz, *Inside China's Secret Three-Front War vs. the U.S.*, WASH. FREE BEACON (Mar. 26, 2014), <http://www.washingtontimes.com/news/2014/mar/26/chinas-three-front-war-against-us/?page=all> [<http://perma.cc/RZ6Y-D2W9>] ("Legal warfare exploits laws to achieve political or commercial objective.").

140. *The U.S. Should Lead the World Away from a Space War*, SCI. AM. (Nov. 1, 2015), <http://www.scientificamerican.com/article/the-u-s-should-lead-the-world-away-from-a-space-war/> [<http://perma.cc/BJP6-99GJ>].

141. See *China Says US Missile Shield Threatens Global Stability*, SPACE WAR (Oct. 29, 2007), [http://www.spacewar.com/reports/China\\_Says\\_US\\_Missile\\_Shield\\_Threatens\\_Global\\_Stability\\_999.html](http://www.spacewar.com/reports/China_Says_US_Missile_Shield_Threatens_Global_Stability_999.html) [<http://perma.cc/43DU-K7TG>] (addressing statements made by the Chinese foreign minister about the placement of U.S. missile defenses in Europe and how it will not ease global security concerns but will instead undermine the global strategic balance).

142. See, e.g., Billings, *supra* note 48, (discussing U.S. senior government leaders' concerns about the growing threat to U.S. satellites and the government's development of offensive space control and active defense strategies and capabilities).

cannot be a future that the global community is resigned to accept.<sup>143</sup> The major space players must be willing to negotiate a new agreement from a position of global concern rather than kicking the can further down the road by proposing agreements that countries know will not be agreeable to other nations.<sup>144</sup> By seriously considering the interests of other nations and the international community, some common ground and room for compromise can surely be found that will move the international community toward securing the peaceful use of space.<sup>145</sup>

Without an agreement, countries might attempt to secure their future space power by moving toward attaining complete space dominance.<sup>146</sup> The United States is currently in the best position to ensure space dominance, but the two players in the United States' review mirror, China and Russia, are unlikely to concede a space victory to the United States.<sup>147</sup> If the United States begins to take measures to dominate space, China and Russia will probably see this as a very provocative maneuver and dedicate enormous resources to prevent such a result.<sup>148</sup>

The strategic advantages of controlling space in future warfare is emerging as a battlespace that has the potential to be as important as sea or air superiority currently is, and has been historically to military power.<sup>149</sup> Because space has the potential to significantly impact the future military might of nations, compromise and global concern will have to play key roles if a destructive arms race is to be prevented.<sup>150</sup> Without compromise and agreement, global stability and security will be in jeopardy

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143. *Id.*

144. See Colleen Driscoll Sullivan, *The Prevention of an Arms Race in Outer Space: An Emerging Principle of International Law*, 4 TEMP. INT'L & COMP. L.J. 211, 237 (1990) (commenting on prior diplomatic games of making proposals that are sure to be rejected by both the United States and the Soviet Union).

145. *Id.* at 236-37.

146. Alexander Chanock, *The Problems and Potential Solutions Related to the Emergence of Space Weapons in the 21st Century*, 78 J. AIR L. & COM. 691, 702 (2013).

147. *Id.* at 692, 697.

148. *Id.* at 697, 703.

149. Maogoto & Freeland, *supra* note 1, at 194.

150. See Sullivan, *supra* note 144, at 235-36 (noting that confronting the current problems that now exist and seeking compromise are the first steps to maintaining the peaceful use of space).

2017]

*WAR ON THE FINAL FRONTIER*

261

as countries jockey to improve their position in the battlefield of space.<sup>151</sup>

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151. See *The U.S. Should Lead the World Away from a Space War*, *supra* note 140 (pointing out the potential dangers of continuing to militarize space and the necessity for world powers to make space a demilitarized zone).