

INTERNATIONAL SPACE LAW AND SPACE AS A WARFIGHTING DOMAIN

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE
Strategic Studies

by

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2021

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REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
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1. REPORT DATE (DD-MM-YYYY) 18-06-2021		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From - To) SEP 2020 – JUN 2021	
4. TITLE AND SUBTITLE International Space Law and Space as a Warfighting Domain				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Huber, Karl, A. Lieutenant Colonel				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD Fort Leavenworth, KS 66027-2301				8. PERFORMING ORG REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution is Unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT In 1967, the Outer Space Treaty (OST) entered into effect, which today has 110 parties, including all the major space-faring nations. The most recognizable details of the treaty include the non-appropriation of space and the use of space for peaceful purposes. However, countries have found loopholes and have interpreted peaceful purposes to mean non-aggressive. These loopholes have led to a fear space would become weaponized. In 1981, Russia proposed a treaty to prevent an arms race in space. Since this proposal, space-faring nations such as China, the United Kingdom, and the European Union (EU) have proposed treaties and codes of conduct to govern behavior in space. In the last three years, the United States has established US Space Command as a combatant command and created an additional military branch, the US Space Force. Through space policy and Space Force doctrine, the US has declared space a warfighting domain. The purpose of this research is to determine if the treaty and code proposals are a valid solution to governing space as a warfighting domain.					
15. SUBJECT TERMS Space Law, Space Warfighting Domain					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT (U)	b. ABSTRACT (U)	c. THIS PAGE (U)			19b. PHONE NUMBER (include area code)
			(U)	113	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

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ABSTRACT

INTERNATIONAL SPACE LAW AND SPACE AS A WARFIGHTING DOMAIN, by
Lieutenant Colonel Karl Huber, 113 pages.

In 1967, the Outer Space Treaty (OST) entered into effect, which today has 110 parties, including all the major space-faring nations. The most recognizable details of the treaty include the non-appropriation of space and the use of space for peaceful purposes. However, countries have found loopholes and have interpreted peaceful purposes to mean non-aggressive. These loopholes have led to a fear space would become weaponized. In 1981, Russia proposed a treaty to prevent an arms race in space. Since this proposal, space-faring nations such as China, the United Kingdom, and the European Union (EU) have proposed treaties and codes of conduct to govern behavior in space. In the last three years, the United States has established US Space Command as a combatant command and created an additional military branch, the US Space Force. Through space policy and Space Force doctrine, the US has declared space a warfighting domain. The purpose of this research is to determine if the treaty and code proposals are a valid solution to governing space as a warfighting domain.

ACKNOWLEDGMENTS

First, I wish to thank my wife and children for their support while writing this thesis. Without their patience, understanding, and encouragement, completion of this thesis would not have happened.

Second, I wish to thank my thesis committee: Dr. John Modinger for agreeing to chair the project. Dr. Modinger was critical in keeping me on track and providing detailed feedback while allowing me enough autonomy to explore the topic as I desired. Dr. Modinger also recommended the additional committee members, Mr. Scott Gayaldick and Mr. Thomas Gray. Mr. Gayaldick was instrumental in providing up-to-date information on this rapidly developing topic. Mr. Gray's passion for all things space was inspirational during the months-long process to complete this thesis. His energy and dedication to the career field are unmatched.

Third, I wish to thank Dr. Dale Spurlin and Dr. Thomas Creviston, who provided the instructions and guidance for how to complete a MMAS within Army Command and General Staff College. Each was critical in providing assessments during the writing process. I also wish to thank my A211 and A221 classmates who provided weekly feedback from a student's perspective on the strengths and weaknesses of my thesis.

Finally, I wish to thank Mrs. Ann Chapman and Mrs. Venita Krueger, whose eye for detail and dedication to CGSC standards ensured this thesis fell within Army publication standards. Without the help from all the individuals above, this thesis would not have been possible.

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ACRONYMS

ASAT	Anti-Satellite
DoD	Department of Defense
EU	European Union
ICBM	Intercontinental Ballistic Missile
LOAC	Law of Armed Conflict
MAD	Mutual Assured Destruction
NSP	National Space Policy
OST	Outer Space Treaty
PAROS	Prevention of an Arms Race in Outer-Space
PPWT	Prevention of the Placement of Weapons in Outer Space
SDI	Strategic Defense Initiative
UK	United Kingdom
UN	United Nations
UNGA	United Nations General Assembly
US	United States
WMDs	Weapons of Mass Destruction

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CHAPTER 1

INTRODUCTION

Every person has the opportunity to share through understanding in the adventures which lie ahead. These opportunities reinforce my conviction that we and other nations have a great responsibility to promote the peaceful use of space and to utilize the new knowledge obtainable from space science and technology for the benefit of all mankind.

—President Dwight D. Eisenhower
National Space Policy of the United States of America

Problem Statement

With the elevation of United States (US) Space Command to a geographic combatant command, the release of the Department of Defense (DoD) Space Strategy, and the establishment of the US Space Force, the Outer Space Treaty (OST) is insufficient to govern space as a warfighting domain.

In October 1967, the OST entered into force.¹ The treaty provided the framework for international space law.² The treaty was the culmination of the work of the Committee on the Peaceful Uses of Outer Space within the United Nations (UN). The text of the treaty captured the world's aspirations for the peaceful exploration of outer space. The treaty recognized the common interest of all mankind and made it clear that

¹ Formally titled Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, US-UK-USSR, January 27, 1967, United Nations (UN) Registration Number 8843, https://treaties.un.org/Pages/showDetails.aspx?objid=0800000280128cbd&clang=_en.

² United Nations General Assembly (UN), RES 2222 (21), Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 21st session, December 19, 1966, https://www.unoosa.org/oosa/oosadoc/data/resolutions/1966/general_assembly_21st_session/res_2222_xxi.html.

space is for peaceful purposes. On May 24, 1967, President Lyndon Johnson signed the OST, and on October 10, 1967, the United States Senate gave unanimous consent to its ratification.³ Since the treaty, the United States has interpreted “peaceful purposes” to mean “non-aggressive and beneficial” purposes consistent with the Charter of the UN and other international law.⁴

The 2020 DoD Space Strategy does not address international law or the use of space for peaceful purposes. The words law and treaty do not appear in the Space Strategy and the word peace only appears one time in the context of a quote addressing all military capabilities.⁵ The Space Force doctrine recognizes in “keeping with international law, the United States acknowledges that the use of space is for peaceful purposes, while preparing for the reality that space must be defended from those who will seek to undermine our goals in space.”⁶ The Space Force doctrine also conveys that military space forces must be “responsible stewards of the space domain.”⁷

³ UN, RES 2222 (21).

⁴ Department of Defense (DOD), *Law of War Manual* (Washington, DC: Office of General Counsel, December 2016), 944.

⁵ Department of Defense (DOD), *Defense Space Strategy Summary* (Washington, DC: Government Publishing Office, June 2020), 6, https://media.defense.gov/2020/Jun/17/2002317391/-1/-1/1/2020_DEFENSE_SPACE_STRATEGY_SUMMARY.PDF.

⁶ Headquarters United States Space Force, Space Capstone Publication, *Spacepower: Doctrine for Space Forces* (Washington, DC: Government Publishing Office, August 2020), 17, https://www.spaceforce.mil/Portals/1/Space%20Capstone%20Publication_10%20Aug%202020.pdf.

⁷ *Ibid.*, 43.

While the OST is referenced once in the Space Force doctrine, the Space Force puts more emphasis on the Law of Armed Conflict (LOAC). However, referencing LOAC indicates the US is preparing for warfighting activity to take place in space and international laws are required to regulate the intensity of warfare. Combined, the DoD Space Strategy and the US Space Force Doctrine indicate at best, space law means well and at worst, is irrelevant in today's space activities. This leads to the conclusion international space law is no longer effective in governing the use of space for peaceful purposes.

To address the mismatch between the use of space for peaceful purposes, and the growing military use of space, several nations have proposed treaties and codes of conduct to govern weapons in space. Almost three decades before the US Space Force, Russia introduced a UN resolution titled the Prevention of an Arms Race in Outer Space (PAROS) in 1981.⁸ PAROS acknowledged the limitations of the OST and sought to prohibit the placement of weapons in outer space.⁹ In 2008, China and Russia introduced a draft treaty titled: "Prevention of the Placement of Weapons in Outer Space (PPWT)," which was a working product based on the PAROS resolution.¹⁰ In 2014, the European Union (EU) proposed a code of conduct, titled: "Draft International Code of Conduct for

⁸ Paul Meyer, "The CR and PAROS, A Short History," UNIDIR Resources, April 2011, <https://www.unidir.org/files/publications/pdfs/the-conference-on-disarmament-and-the-prevention-of-an-arms-race-in-outer-space-370.pdf>.

⁹ Ibid., 2.

¹⁰ Ibid., 5.

Outer Space Activities.”¹¹ Unlike a treaty, the proposed code is non-binding, and while it focused on preventing an arms race, it also includes trust and confidence building measures to reinforce responsible behavior in space. In 2020, the United Kingdom (UK) also introduced a code of conduct seeking a UN resolution to agree upon responsible behavior in space.¹² In December 2020, the UN resolution was backed by 160 countries, and set a date of September 2021 for countries to report existing and potential threats and share their ideas for further norms, rules, and principles of responsible behavior to reduce the risks of misunderstandings and miscalculations in outer space.¹³

To date, the proposals have been rejected by at least one of the major space faring nations. Each rejection argues some degree of restriction within the proposal is unacceptable, or the proposal does not address ground-based threats to space assets. This leaves the international community in a situation where the OST is outdated, but there is not a consensus on the way forward. Further, the United States has taken bold steps to declare space a warfighting domain, without offering any solutions for future governance. This research seeks to determine if the treaty proposals and recommended codes of

¹¹ European External Action Service, *International Code of Conduct for Outer Space Activities* (Draft, March 31, 2014), https://eeas.europa.eu/archives/docs/non-proliferation-and-disarmament/pdf/space_code_conduct_draft_vers_31-march-2014_en.pdf.

¹² Foreign and Commonwealth Office, Ministry of Defence, The Rt Hon Dominic Raab MP, and The Rt Hon Ben Wallace MP, “UK Push for Landmark UN Resolution to Agree Responsible Behaviour in Space,” Gov.UK, August 26, 2020, <https://www.gov.uk/government/news/uk-push-for-landmark-un-resolution-to-agree-responsible-behaviour-in-space>.

¹³ United Nations General Assembly (UN), A/RES/75/36, Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, 75th session, December, 2020, 3, <https://digitallibrary.un.org/record/3895440?ln=en>.

conduct are a valid solution to govern space as a warfighting domain, and if not, looks to international law that is not space specific as an alternative.

Proposed Research Question

Are the space treaty proposals and recommended codes of conduct a valid solution to govern space as a warfighting domain?

Secondary Research Question

Are other international laws, such as the LOAC, sufficient to govern warfighting activities in space without adding new treaties or amendment the current space treaties?

Other Questions to Explore

What effect does the 1967 treaty have on space operations as envisioned in Space Force doctrine? What capabilities does Space Force doctrine envision in the near future? What treaty renegotiations or proposals have occurred recently that potentially affect military operations in space? What space domain capabilities ought to be excluded by a space treaty to ensure competing states are denied those capabilities as well? How can the US military gain an advantage in space to accomplish its mission of defending the United States and comply with international laws?

Methodology

This research will use qualitative methodology since the question for this research is open ended: are the treaty proposals and codes of conduct a valid solution to govern space as a warfighting domain? The qualitative methodology will use the case study analysis approach. To analyze if a treaty proposal or code of conduct is valid, Colonel Art Lykee's (Army War College Professor) strategy tests, expanded by Dr. Harry Yarger's

(Army War College) screening criteria of suitability, feasibility and acceptability will be examined. Chapter 3 of this thesis provides an explanation of the research method used.

Purpose of Research

The purpose of the research is to determine if the space treaty proposals and codes of conduct provide a valid solution to govern space as a warfighting domain. While countries have been using space for military purposes for decades, the United States has recently taken bold steps by declaring space as a warfighting domain. The disparity between the 1960s space treaties and 2020s use of space continues to widen. To address this disparity, four universities with space law programs have recently joined together to address space law deficiencies related to military operations.¹⁴ Due to this gap in literature, the universities have initiated a project titled the “Woomera Manual in the International Law of Military Space Operations.”¹⁵ According to the project, “there has been no comprehensive examination of the application of law on the resort to the use of force by and against States and the law of armed conflict in outer space.”¹⁶

The identification of space as a warfighting domain in the US National Defense Space Strategy has accelerated the possibility that States will fight a war in space.¹⁷

¹⁴ University of Adelaide, The University of Exeter, The University of Nebraska, and the University of New South Wales–Canberra, “The Woomera Manual” (International Research Project, Adelaide Law School, University of Adelaide, Adelaide, Australia), accessed October 18, 2020, <https://law.adelaide.edu.au/woomera/>.

¹⁵ University of Adelaide, “The Woomera Manual, About,” accessed October 18, 2020, <https://law.adelaide.edu.au/woomera/about>.

¹⁶ Ibid.

¹⁷ DOD, *Defense Space Strategy Summary*.

While the Woomera Project's goal is to write a manual articulating and clarifying existing international law applicable to military space operations, it does not attempt to evaluate the proposed treaties and codes of conduct to govern space. The purpose of this study is to answer the primary research question: are the space treaty proposals and recommended codes of conduct a valid solution to govern space as a warfighting domain?

Background

Prior to the 1967 OST, there were efforts to limit the use of weapons of mass destruction (WMDs) in space. In 1960, President Dwight D. Eisenhower addressed the UN General Assembly, where he proposed that the principles of the Antarctic Treaty¹⁸ be applied to outer space and celestial bodies.¹⁹ Initially, the Soviet Union did not agree to restrict space to peaceful purposes, however, this position changed in 1963 when Soviet Foreign Minister Gromyko told the United Nations General Assembly (UNGA) that the Soviet Union wanted an agreement banning the orbiting of objects carrying nuclear weapons.²⁰ In 1963 the UNGA unanimously adopted a resolution calling upon all states not to place weapons of mass destruction into space. In the same year, the Soviet Union, United Kingdom, and the United States entered into a treaty which banned nuclear

¹⁸ For full text, view Bureau of Arms Control, Verification, and Compliance, "Antarctic Treaty," US Department of State (DOS), accessed September 27, 2020, <https://2009-2017.state.gov/t/avc/trty/193967.htm>.

¹⁹ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (UN).

²⁰ Ibid.

weapon tests in the atmosphere, outer space, and under water..²¹ The Treaty Banning Nuclear Tests in the Atmosphere, in Outer Space and Under Water set the groundwork for the governance of WMDs in the 1967 OST.

Article IV of the OST specifically addresses nuclear weapons and weapons of mass destruction. “States Parties to the Treaty undertake not to place into orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.”²² The treaty was the second of the non- armament treaties, where some of its provisions were modeled on the Antarctic Treaty..²³ The treaty set out to prevent “a new form of colonial competition” in space..²⁴

In addition to governing WMDs in space, Article IV of the OST requires the moon and other celestial bodies be used exclusively for peaceful purposes..²⁵ Countries cannot establish military bases, installations, and fortifications and are forbidden from

²¹ Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, US-UK-USSR, August 5, 1963, United Nations (UN) Registration Number 6964, <https://treaties.un.org/pages/showDetails.aspx?objid=08000002801313d9>.

²² Bureau of Arms Control, Verification, and Compliance,. “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,” US Department of State (DOS), accessed September 27, 2020, <https://2009-2017.state.gov/t/isn/5181.htm#:~:text=It%20was%20opened%20for%20signature,provisions%20is%20in%20Article%20IV>.

²³ Ibid.

²⁴ Ibid.

²⁵ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (UN).

testing any weapons and conducting military maneuvers on celestial bodies.²⁶ However, the use of military personnel for scientific research or other peaceful purposes is allowed.²⁷

Before the OST, both the United States and the Soviet Union tested nuclear weapons in space.²⁸ Since the treaty, nuclear weapons have not been tested in space. However, there is enough ambiguity in the treaty that spacefaring nations have found ways to use space for military purposes without blatantly violating the treaty. First, Article IV prohibits parties from placing WMDs in *orbit* around the Earth. Second, Article IV requires the moon and other celestial bodies be used exclusively for peaceful purposes. This leaves open an argument that as long as WMDs are not placed in orbit around the Earth, there is no violation of the treaty.

While the moon and other celestial bodies must be used exclusively for peaceful purposes, it is possible to use a spacecraft not in orbit and not stationed on the moon or other celestial bodies to deliver WMDs.²⁹ For example, Intercontinental Ballistic Missiles (ICBMs) travel from Earth through space and back to Earth. ICBMs do not

²⁶ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (UN).

²⁷ Ibid.

²⁸ EIS Council, “Report: USSR Nuclear E.M.P. Upper Atmosphere Kazakhstan Test 184,” accessed May 13, 2021, https://www.eiscouncil.org/App_Data/Upload/a4ce4b06-1a77-44d8-83eb-842bb2a56fc6.pdf.

²⁹ Pavle Kilibarda, “Space Law Revisited: Are Weapons of Mass Destruction Prohibited in Space?,” Humanitarian Law and Policy, March 21, 2017, <https://medium.com/law-and-policy/space-law-revisited-are-weapons-of-mass-destruction-prohibited-in-space-da4595d84d3e>.

violate the OST since they are not in orbit or stationed on the moon or other celestial bodies even though the flight trajectory goes through outer space.³⁰ Additionally, several militaries use communications and global positioning satellites to conduct offensive and defensive military actions, including guided ordnance.³¹ The militarization of space was evident before the OST, and since the treaty, countries have tiptoed around to gain any military advantage possible using space as a medium.

One of the most controversial military space projects was the 1983 Strategic Defense Initiative (SDI), often referred to as “Star Wars” which sought to build a satellite network that could detect and destroy ballistic missiles.³² The project was criticized because it posed a challenge to the principles of the Mutual Assured Destruction (MAD) theory. Under the MAD theory, any state with nuclear weapons would not attack another state with nuclear weapons because they could destroy each other within an hour. If the SDI was successful, MAD would no longer be a deterrent, and SDI would provide an ability to survive while destroying the enemy. Even a controversial program such as SDI was not analyzed through the OST, but through the Antiballistic Missile Treaty. Further,

³⁰ Jackson Nyamuya Maogoto and Steven Freeland, “Space Weaponization and the United Nations Charter Regime on Force: A Thick Legal Fog or a Receding Mist?” *The International Lawyer* 41, no. 4 (Winter 2007): 1091-1119, <https://www.law.upenn.edu/live/files/7860-maogoto-and-freeland-space-weaponizationpdf>.

³¹ Megan Bartels, “Space Has Always Been Militarized, Just Not Weaponized—Not Yet, Anyway,” Space.com, November 1, 2018, <https://www.space.com/42298-space-weaponized-already-military-history.html>.

³² Louis de Gouyon Matignon, “The Strategic Defense Initiative and Outer Space Military Laws,” Space Legal Issues, April 16, 2019, 11, <https://www.spacelegalissues.com/the-strategic-defense-initiative-and-outer-space-military-laws/>.

the SDI was a defensive capability and arguably protected under Article 51 (self-defense) of the UN Charter.³³

In 1985, the US Space Command was established as a functional Combatant Command. Its mission was to coordinate the use of military space forces and provide missile warning, navigation, communication weather, and intelligence.³⁴ In 2002, Space Command lost its combatant command status, and the mission of space operations were relocated under US Strategic Command.³⁵ The designation was in large part due to the September 11, 2001, attacks on the US. The attacks led to the reshaping of the combatant command structure. President George W. Bush wanted to create a new Northern Command, but wanted to keep the combatant command number at ten, therefore, US Space Command was placed under the command of US Strategic Command.³⁶

³³ Scott F. March, "An Interdisciplinary Approach to the Strategic Defense Initiative Debate," *Akron Law Review* 19, no. 3 (July 2005): 351, <https://ideaexchange.uakron.edu/cgi/viewcontent.cgi?article=1759&context=akronlawreview>.

³⁴ Frank A. Rose, "Re-establishing U.S. Space Command is a Great Idea," *Order from Chaos* (blog), *Brookings Institution*, January 7, 2019, <https://www.brookings.edu/blog/order-from-chaos/2019/01/07/re-establishing-u-s-space-command-is-a-great-idea/>.

³⁵ Marcia Smith, "U.S. Space Command Reestablished after 17 Year Hiatus," *SpacePolicyOnline*, August 29, 2019, <https://spacepolicyonline.com/news/u-s-space-command-reestablished-after-17-year-hiatus/#:~:text=The%20original%20USSPACECOM%20was%20created,the%20total%20number%20at%2010>.

³⁶ *Ibid.*

Fast forward to December 18, 2018, and President Donald J. Trump directed the US Space Command's re-establishment as a combatant command.³⁷ Shortly after, on February 19, 2019, President Trump issued Space Policy Directive-4 to establish the US Space Force as a new branch of the military.³⁸ Congress also had to approve Space Command through the National Defense Authorization Act 2020. From these actions, three major steps were taken by the US government to identify space as a warfighting domain.

The first step was reestablishing US Space Command and designating it as a geographical combatant command.³⁹ The previous US Space Command was designated as a functional combatant command. The Chairman of the Joint Chiefs of Staff, through Joint Publication-1 (JP-1) identifies functional commanders as having "transregional responsibilities and normally supporting to the geographic combatant commanders in

³⁷ Donald J. Trump, Memorandum for the Secretary of Defense, Subject: Establishment of the United States Space Command as a Unified Combatant Command (Washington, DC, December 18, 2018), <https://aerospace.csis.org/wp-content/uploads/2019/02/US-Space-Command-memo-18Dec18.pdf>.

³⁸ Donald J. Trump, Space Policy Directive 4, Establishment of the United States Space Force (Washington, DC, February 19, 2019), <https://trumpwhitehouse.archives.gov/presidential-actions/text-space-policy-directive-4-establishment-united-states-space-force/>.

³⁹ US Space Command Public Affairs, "US Space Command Establishment Ceremony Launches New Era of Space Superiority Capabilities," US Space Command, August 30, 2019, <https://www.spacecom.mil/MEDIA/NEWS-ARTICLES/Article/1948103/us-space-command-establishment-ceremony-launches-new-era-of-space-superiority-c/>.

their AOR.”⁴⁰ However, the new Space Command is no longer a functional command; instead, it is designated as a geographic combatant command. Joint Publication-1 describes Geographic Combatant Commanders as assigned a geographic area of responsibility by the President with the Secretary of Defense’s advice as specified in the Unified Command Plan.⁴¹ The Unified Command Plan is a document approved by the President laying out the basic guidance, missions, and force structure for all unified combatant commands.⁴²

During the August 2019 Rose Garden Ceremony re-establishing Space Command, President Trump stated, “So just as we have recognized land, air, sea and cyber as vital warfighting domains, we will now treat space as an independent region overseen by a new unified geographic combatant command.”⁴³ In a press conference the same day, General John Raymond (the first appointed Space Command Commander) identified Space Command as a “geographic combatant command that’s going to have a singular

⁴⁰ Joint Chiefs of Staff (JCS), Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United States* (Washington, DC: Government Publishing Office, March 2013, incorporating Change 1), xvii, https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp1_ch1.pdf.

⁴¹ Ibid.

⁴² Department of Defense (DOD), *Dictionary of Military Terms* (Washington, DC: Government Publishing Office, June 2020), 224.

⁴³ Donald J. Trump, “Remarks by President Trump at the Event Establishing the U.S. Space Command,” (The White House, Washington, DC, August 29, 2019), <https://www.govinfo.gov/content/pkg/DCPD-201900577/html/DCPD-201900577.htm>.

focus on the space domain.”⁴⁴ While this may seem like a mere issue of semantics, the designation of Space Command as a geographic combatant command indicates the US views space a place where military battles may be fought.⁴⁵

The second step that led to the identification of space as a warfighting domain was the establishment of the US Space Force. Just months after Space Command was formally reestablished, the Space Force was created through the National Defense Authorization Act for Fiscal Year 2020 (December 2019).⁴⁶ Under the National Defense Authorization Act, the Space Force shall be organized, trained and equipped to provide (1) freedom of operation for the United States in, from, and to space; and to (2) prompt and sustained space operations. The Space Force’s duties shall be “to (1) protect the interests of the United States in space (2) deter aggression in, from, and to space, and (3) conduct space operations.”⁴⁷

⁴⁴ John Raymond, “Media Roundtable with U.S. Space Command Commander Gen. John Raymond,” Transcript, August 29, 2019, <https://www.defense.gov/Newsroom/Transcripts/Transcript/Article/1949346/media-roundtable-with-us-space-command-commander-gen-john-raymond/>.

⁴⁵ The Unified Command Plan is classified, however, between the December 18, 2018, memo establishing Space Command as a functional command and the August 2019 Rose Garden ceremony identifying Space Command as a geographic command, the President signed a memorandum on May 24, 2019, making revisions to the 2017 Unified Command Plan. It is possible the change from functional to geographic was included in the revisions. Donald J. Trump, Memorandum for the Secretary of Defense, Subject: Revisions to the 2017 Unified Command Plan (The White House, Washington, DC, May 24, 2019), <https://www.govinfo.gov/content/pkg/DCPD-201900342/pdf/DCPD-201900342.pdf>.

⁴⁶ National Defense Authorization Act for Fiscal Year 2020, 116th Cong., 1st sess. (December 19, 2020): S. 1790, US Code 10 (2020) § 9081, <https://www.govinfo.gov/content/pkg/BILLS-116s1790enr/pdf/BILLS-116s1790enr.pdf>.

⁴⁷ Ibid.

The third step to identifying space as a warfighting domain was the release of DoD strategy and US Space Force doctrine. The June 2020 National Defense Space Strategy Summary begins by declaring “Space is now a distinct warfighting domain.”⁴⁸ The United States identifies the “actions, intentions, and military strategies of potential adversaries have transformed space into a warfighting domain.”⁴⁹ The strategy highlights the new geographic role within its strategic approach. “The Department is rapidly transforming its approach to space from a support function to a warfighting domain in order to achieve our desired conditions and strategic objectives over the next ten years in the face of identified threats, challenges, and opportunities.”⁵⁰ Within the strategy’s first line of effort to build a comprehensive military advantage in space, a specific objective is to “develop and expand space warfighting expertise and culture.”⁵¹ The word “warfighting” is used nine times within the ten page document.

Shortly after the National Defense Space Strategy was released, the US Space Force released its first doctrine in August 2020.⁵² In line with the National Defense Space Strategy, the doctrine makes it clear the United States considers space a warfighting domain. The doctrine uses the words warfighting or warfighter 43 times and the word warfare 80 times throughout the 41-page document. Chapter 5 specifically

⁴⁸ DOD, *Defense Space Strategy Summary*, 1.

⁴⁹ *Ibid.*, 3.

⁵⁰ *Ibid.*, 6.

⁵¹ *Ibid.*

⁵² Headquarters United States Space Force, *Spacepower*.

focuses on developing individuals with a warfighter mentality. “Military space forces—*protectors of America’s space interests*—are first and foremost warfighters who protect, defend, and project United States spacepower” [original italics].⁵³

Further, the doctrine identifies a warfighting culture that “is the defining difference between operating space-based information systems and employing credible military space power.”⁵⁴ Additionally, Air University, which falls under the Air Force Air Education and Training Command, announced that it is “incorporating space as a warfighting domain into curricula across all distance learning and in resident programs.”⁵⁵

The United States’ rapid recognition of space as a warfighting domain has led to the point where the peaceful purposes requirement of the OST has left the treaty in a place where it can no longer effectively govern space.

Assumptions

Assumptions are “any underlying proposition or statement that must be accepted as true in order to undertake such research.”⁵⁶

⁵³ Headquarters United States Space Force, *Spacepower*, xiii.

⁵⁴ *Ibid.*, 48.

⁵⁵ Phil Berube, “Air University Teaches Space as a Warfighting Domain,” US Air Force, August 8, 2020, <https://www.af.mil/News/Article-Display/Article/2302401/air-university-teaches-space-as-a-warfighting-domain/#:~:text=AU%20is%20incorporating%20space%20as,Force%20Cyber%20College%2C%20Curtis%20E>.

⁵⁶ US Army Command and General Staff College (CGSC), Student Text (ST) 20-10, *Master of Military Art and Science (MMAS) Research and Thesis* (Fort Leavenworth, KS: CGSC, August 2019), 34.

The first assumption is that space is a warfighting domain. The United States has made it clear that the US considers space a warfighting domain.⁵⁷ At a space symposium in Colorado Springs in 2019, Acting Secretary of Defense Patrick Shanahan remarked “Space is no longer a sanctuary—it is now a war-fighting domain.”⁵⁸ However, it is unclear if other nations consider it a warfighting domain and there is no DoD definition of “warfighting domain.”⁵⁹ To begin the process of drafting or amending treaties, nations must agree on the initial problem that needs to be addressed. If other nations, especially the space faring nations, do not consider space a warfighting domain, no effort will be made to amend the treaties.

In the early 1960s, the United States took the lead in seeking to declare space use for peaceful purposes, however, the Soviet Union was reluctant to agree due to their own testing of weapons in space.⁶⁰ Despite arguing space should be used for peaceful purposes, in 1962 the United States detonated a nuclear bomb 250 miles above the

⁵⁷ C. Todd Lopez, “Shanahan, Space No Longer Peaceful,” *Defense News*, April 9, 2019, <https://www.defense.gov/Explore/News/Article/Article/1810085/shanahan-space-no-longer-peaceful/>.

⁵⁸ Ibid.

⁵⁹ Office of the Chairman of the Joint Chiefs of Staff (CJCS), *Dictionary of Military and Associated Terms* (Washington, DC: The Joint Staff, January 2021), <https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf?ver=idnWjT-PxzWCi3IHTV1-xQ%3d%3d>.

⁶⁰ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (DOS).

Pacific Ocean through a project named Starfish Prime.⁶¹ This drastic step was a catalyst to bring parties to the table to negotiate a treaty addressing the use of nuclear weapons. Within a year, the US, the UK, and the Soviet Union signed the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water.⁶² Five years later, the OST was signed by the US and the Soviet Union.

Since the early 1980s, several nations submitted initiatives to prohibit the placement of weapons in space.⁶³ These proposals were submitted to the UN Committee on Disarmament and are generally referred to as “Prevention of an Arms Race in Outer-Space” (PAROS). Russia argued these proposals were necessary because the OST only limited WMDs in orbit space and from placing weapons on the moon and other celestial bodies. The OST had a loophole for conventional weapons system that could be placed into orbit without being placed on a celestial body.⁶⁴ China has typically agreed with Russia arguing existing legal instruments were inadequate and “did not prevent launching into space and testing in space of conventional weapons as well as weapons based on new physical principles, such as lasers, very high frequency weapons, particle beam weapons and others.”⁶⁵

⁶¹ Gilbert King, “Going Nuclear over the Pacific,” *Smithsonian Magazine*, August 15, 2012, <https://www.smithsonianmag.com/history/going-nuclear-over-the-pacific-24428997/>.

⁶² Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water (UN).

⁶³ Meyer, “The CR and PAROS, A Short History.”

⁶⁴ Ibid.

⁶⁵ Ibid., 3.

Despite the efforts of two of the largest spacefaring nations, the work on PAROS was very sporadic between 1981 and 2002.⁶⁶ Several ad-hoc committees were formed within the UN Committee on Disarmament, but long periods of time between meetings and proposals have left PAROS in a discussion phase without moving onto actual negotiations and terms. Canada became involved in 1998, proposing a convention for the non-weaponization of space. Canada wanted to move out of a discussion phase and explore if it was ready to enter a negotiation phase. Even with the addition of Canada, very little progress was made.⁶⁷

In the 2000s, Canada, China, and Russia submitted working papers outlining possible elements of a future legal framework to prevent weapons' deployment in outer space.⁶⁸ In 2008, China and Russia submitted a draft treaty to prevent the placement of weapons in outer space (PPWT).⁶⁹ In 2014, The EU submitted a draft International Code of Conduct for Outer Space Activities.⁷⁰ While the words war and warfighting do not

⁶⁶ Meyer, "The CR and PAROS, A Short History."

⁶⁷ Ibid.

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ European External Action Service, *International Code of Conduct for Outer Space Activities* (Draft).

appear in either the PPWT.⁷¹ or the EU proposed Code of Conduct,⁷² both documents clarify that an arms race in space should be avoided, and peace is still the number one priority in space exploration.

During this time, the United States only submitted documents offering a critique of the PPWT. The United States dismissed the PPWT as “fundamentally flawed.” US Ambassador Robert Wood argued the PPWT lacked a verification mechanism and no restrictions on the development and stockpiling of anti-satellite (ASAT) weapons.⁷³ The US concern focused on “direct-ascent” weapons launched from the ground.⁷⁴ The US emphasized the use of nonbinding agreements, transparency, and confidence-building mechanisms to improve space security.

Today, the US views space as a warfighting domain; however, this view is the result of China and Russia’s space activities according to DoD officials. In October 2020, Justin Johnson, Acting Deputy Assistant Secretary of Defense for Space Policy, discussed the DoD’s Space Strategy at a Heritage Foundation event. In his speech, Johnson pointed to China and Russia, stating “(they) are aggressively developing

⁷¹ Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (Draft), Ministry of Foreign Affairs of the People’s Republic of China (MFA PRC), June 16, 2014, https://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/jks_665232/kjfywj_665252/t1165762.shtml.

⁷² European External Action Service, *International Code of Conduct for Outer Space Activities* (Draft).

⁷³ Jeff Foust, “U.S. Dismisses Space Weapons Treaty Proposal as Fundamentally Flawed,” *Space News*, September 11, 2014, <https://spacenews.com/41842us-dismisses-space-weapons-treaty-proposal-as-fundamentally-flawed>.

⁷⁴ Ibid.

counter-space capabilities specifically designed to hold US and allied space capabilities at risk. China and Russia have made space a warfighting domain.”⁷⁵ While China and Russia may argue differently, for the purposes of this research, it is assumed space is a warfighting domain.

The second assumption is that even if other nations consider space a warfighting domain, and new treaties are required, international law can govern space in general. To date, only one significant case has evoked a space treaty, and that was under the Convention on International Liability for Damaged Cause by Space Objects, not the OST.⁷⁶ A Russian launched, nuclear-powered satellite, Cosmos 954, crashed to Earth in 1978, with debris landing over several areas in Canada. The case never reached international court, although the Soviet Union and Canada eventually agreed on a roughly \$3 million Canadian dollar settlement.⁷⁷ However, absent of evidence the OST has been violated, it can be argued the current treaty is doing exactly what it is designed to accomplish. Until there is an actual military conflict in space, the treaty has not been violated and is therefore, providing the governing framework that has kept space peaceful.

⁷⁵ David Vergun, “DOD Official Outlines Space Strategy,” *Defense News*, October 7, 2020, <https://www.defense.gov/Explore/News/Article/Article/2375244/dod-official-outlines-space-strategy/>.

⁷⁶ United Nations General Assembly (UN), 2777 (26), Convention on International Liability for Damaged Cause by Space Objects, 1998th Plenary Meeting, November 29, 1971, <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/liability-convention.html>.

⁷⁷ Alexander F. Cohen, “Cosmos 954 and the International Law of Satellite Accidents,” *Yale Journal of International Law* 10, no. 78 (1984): 80, <https://core.ac.uk/download/pdf/72839474.pdf>.

The third assumption going into the research is that new international treaties or amendments to current space treaties will be able to govern space specifically as a warfighting domain. The space treaties have worked well enough to date, however, recognizing space as a warfighting domain may require much more than just a new treaty or amendments to the current treaties. On the other hand, space could be governed by a totality of the currently regulations, including international treaties, domestic laws, bilateral treaties, civil litigation, customary international law and the LOAC. Combined these various avenues of approach could provide more effective means of governing space than a new international treaty, or amendments to the current space treaties.

Key Terms and Definitions

OST: Outer Space Treaty—short title for the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Article IV, October 10, 1967.

PAROS: Prevention of an Arms Race in Outer-Space—series of proposals to address the weaponization in space.

PPWT: Prevention of the Placement of Weapons in Outer Space—2008 draft treaty by Russia and China.

Space Domain: The area surrounding Earth at altitudes of greater than or equal to 100 kilometers above mean sea level.⁷⁸ Space is a physical domain within which military, civil, and commercial activities are conducted.

⁷⁸ CJCS, *Dictionary of Military and Associated Terms*.

Weapon (Proposed definition in PPWT): Weapon in outer space means any outer space object or its component produced or converted to eliminate, damage or disrupt normal functioning of objects in outer space, on the Earth's surface or in the air, as well as to eliminate population, components of biosphere important to human existence, or to inflict damage to them by using any principles of physics.⁷⁹

Scope

Scope describes the research boundaries set to answer the question.⁸⁰ This research will cover space law developments from the 1950s through today. This research will not consider the debates of whether space weaponization is moral, ethical, or justifiable. While the weaponization and use of space for other than peaceful purposes must be addressed, this research is not meant to argue the feasibility or practicality of space weapons. The research will focus on what legal measures are required to govern space since the largest space faring nation considers space to be a warfighting domain.

Limitations

Limitations are weaknesses imposed by constraints or restrictions beyond the researcher's control.⁸¹ In this research, many government documents related to space are classified, however, no classified documents will be included in this thesis. For example, the DoD released a Space Strategy Summary indicating the actual summary is

⁷⁹ Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (Draft), MFA PRC, Article I.

⁸⁰ CGSC, ST 20-10, 35.

⁸¹ Ibid.

classified.⁸² Despite this limitation, it will not have any effect on the outcome of this research. The unclassified document makes it clear the United States considers space a warfighting domain. The classified portions may provide a more convincing argument that space law treaties need to be updated immediately. However, the 'US' aggressive stance over the last few years is already further along than any other spacefaring nations have publicly displayed. This overt stand should provide enough evidence to determine if new space treaties or amendments to current treaties are required.

Delimitations

Delimitations are constraints the researcher imposes on the scope or content so the research is feasible.⁸³ This research will examine current treaties, proposed treaties, law journals, books, and dissertations concerning space law and military developments in space. This research will not debate the usefulness and effectiveness of international treaties in general. It is widely understood the enforcement of international treaties is often tricky.⁸⁴ This is particularly true in space where violations may go undetected or unnoticed by the public. However, just because it may be difficult to enforce does not set the precedent that rules should not be established to govern space as a warfighting domain.

⁸² DOD, *Defense Space Strategy Summary*.

⁸³ CGSC, ST 20-10, 35.

⁸⁴ United Nations (UN), "Fact Sheet #5, Understanding International Law," 2010 Treaty Event, Towards Universal Participation and Implementation, accessed May 13, 2021, https://treaties.un.org/doc/source/events/2010/Press_kit/fact_sheet_5_english.pdf.

Significance of the Study

This research is significant due to the recent establishment of US Space Command as a geographic combatant command (August 2019), the creation of a sixth military branch (The US Space Force, March 2020), the release of the United States DoD Space Strategy (June 2020) and the release of Space Command doctrine (August 2020). The recent posturing of the US designating space as a warfighting domain is beyond any previous defined, domain designations. Space law has not kept up with the pace of military advancements and is not prepared to govern space as a warfighting domain, particularly because of the requirement of space law that the use of space is for peaceful purposes.

Further, the establishment of Space Command as a geographic Combatant Command and the Space Force as a military branch has gone relatively unnoticed in the public and by people within the Air Force and the military. At this point, the Space Force is often mentioned followed by a snarky smile. Even a comedy show on Netflix, *Space Force*, plays into the narrative that Space Force is not to be taken seriously.⁸⁵ However, the international community must come to terms that the US considers space a warfighting domain, and efforts to govern space as such must be accelerated.

Chapter Conclusion

This thesis argues the current body of laws governing space must be updated to effectively govern space as a warfighting domain. While efforts like PAROS and the

⁸⁵ *Space Force Series*, 3rd Arts Entertainment, aired 2020 on Netflix, <https://www.netflix.com/title/81021929>.

PPWT have advocated changes to space law since the early 1980s, the recent establishment of a geographic combatant command (US Space Command), the addition of another branch of the military dedicated to space (US Space Force) and view of space as a warfighting domain make it clear it is time for the international community to address warfighting in space through international governance.

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of this literature review is to analyze the body of work to answer the primary research question: Are the space treaty proposals and recommended codes of conduct a valid solution to govern space as a warfighting domain?

This literature review is divided into three sections. The first section will review the OST and the four treaties that were products of the OST, as well as books and law journal articles dedicated to developing space law through the late 1990s. This section will provide the framework and parameters that set the foundation for the remainder of chapter 2.

The second section will examine US Space policies from the early 2000s to 2020 and written works concerning these policies. It will include a review of the National Security Strategy, the National Space Strategy, The Defense Space Strategy and the US Space Force doctrine and other US government documents concerning space. This section will also review newspaper and journal articles written on the US Space Command and the US Space Force.

The third section will review the positions of spacefaring nations concerning the weaponization of space, proposed amendments, treaties and codes of conduct for space regulation, although the in-depth analysis of these documents will be covered in chapter 4 of this thesis. This section will include proposals from, Russia, China, Canada, and the EU through the review of PAROS, PPWT, and the proposed International Code of Conduct for Outer Space Activities. This section will lay the foundation for chapter 3,

which will explore the research methods used to address this thesis's primary and secondary questions.

Section 1

Currently, there are several international, multinational, and bilateral treaties that comprise of space law. The primary treaty this research will focus on is the OST of 1967 since it was the first international treaty specifically governing space. The OST was the result of eight years of negotiations within the UN Committee on the Peaceful Uses of Outer Space.⁸⁶ In order to develop new treaties concerning space law, or make amendments to current treaties, it is important to examine the genesis of space law.

In December 1961, the United Nations General Assembly (UNGA) adopted Resolution 1721, which made it clear: “(a) International law, including the Chapter of the United Nations, applies to outer space and celestial bodies; (b) Outer space and celestial bodies are free for exploration and use by all States in conformity with international law and are not subject to national appropriation”⁸⁷ Resolution 1721 set the framework for the development of international space law.

⁸⁶ United Nations Office for Outer Space Affairs (UNOOSA), “Committee on the Peaceful Uses of Outer Space,” accessed May 13, 2021, <https://www.unoosa.org/oosa/en/ourwork/copuos/index.html>.

⁸⁷ United Nations General Assembly (UN), 1721 (16), International Co-operation in the Peaceful Use of Outer Space, 1085th Plenary Meeting, December 20, 1961, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/resolutions/res_16_1721.html.

According to Dr. Eilene Galloway, often referred to as “the grand dame of space” who helped write the National Aeronautics and Space Act,⁸⁸ space law has four characteristics: “it is national and international and applies to both outer space as a geographic area and to functions performed in that area.”⁸⁹ Galloway points out there is a tendency to propose new treaties for specific space applications, and too many treaties with differing rosters can create complications with member states and ratifying bodies.⁹⁰

In line with Galloway’s argument that space law should maximize parties, the former director of the UN Office for Outer Space Affairs, Attorney Nandasiri Jasentuliyana, states the “Consensus Principle” is responsible for the development of space law.⁹¹ The space treaties were adopted by consensus through negotiations to accommodate a range of positions and accounted for the full range of views and interests in space.⁹² This effort to compromise ensured that the space treaties were acceptable not only to the major space powers, but to all nations.⁹³ While the Outer Space Committee was the first to use a consensus principle in its purest form, today’s challenge is that there

⁸⁸ Linda Billings, “Eilene Galloway, The Woman Who Helped Create NASA Dies at Age 102,” NASA, May 4, 2009, https://www.nasa.gov/topics/history/features/galloway_obit.html.

⁸⁹ Eilene Galloway, “Creating Space Law,” in *Space Law Development and Scope*, ed. Nandasiri Jasentuliyana (Westport, CT: Praeger, 1992), 239-256.

⁹⁰ Ibid.

⁹¹ Nandasiri Juasentuliyana, “The Law Making Process in the United Nations,” in *Space Law Development and Scope*, ed. Nandasiri Jasentuliyana (Westport, CT: Praeger, 1992), 33-44.

⁹² Ibid.

⁹³ Ibid.

are more spacefaring nations and that major space powers must agree, while not neglecting the needs of smaller nations developing space programs.⁹⁴

In 1967, the OST solidified the aspirations for space to be used for peaceful purposes. To date, the treaty has 107 party members.⁹⁵ The UN Office of Outer Space Affairs identifies the following principles within the treaty:

- The 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;
- Outer space shall be free for exploration and use by all States;
- Outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means;
- States shall not place nuclear weapons or other weapons of mass destruction in orbit or on celestial bodies or station them in outer space in any other manner;
- The Moon and other celestial bodies shall be used exclusively for peaceful purposes;
- Astronauts shall be regarded as the envoys of mankind;
- States shall be responsible for national space activities whether carried out by governmental or non-governmental entities;
- States shall be liable for damage caused by their space objects; and
- States shall avoid harmful contamination of space and celestial bodies.⁹⁶

⁹⁴ Juasentuliyana, “The Law Making Process in the United Nations.”

⁹⁵ James Martin Center for Nonproliferation Studies, “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty),” Nuclear Threat Initiative, last updated January 31, 2019, <https://www.nti.org/learn/treaties-and-regimes/treaty-principles-governing-activities-states-exploration-and-use-outer-space-including-moon-and-other-celestial-bodies-outer-space-treaty/>.

⁹⁶ UN, RES 2222 (21).

According to Attorney Nandasiri Jasentuliyana, scholars have pointed out deficiencies within the treaties, including poorly draft provisions open to interpretation.⁹⁷ For example, China has argued the legal instruments for space are inadequate and “did not prevent launching into space and testing in space of conventional weapons as well as weapons based on new physical principles, such as lasers, very high frequency weapons, particle beam weapons and others.”⁹⁸ However, Jasentuliyana notes that while it is important to work towards “juridical purity, legal perfectionism which ignores political reality would result in the elaboration of magnificent texts which would never come into force.”⁹⁹

Professor Joanne Gabrynowicz, Professor Emerita of space law at the Mississippi Space Law Center and editor in chief of the *Journal of Space Law*, has written that “a hallmark of US national space law is that it tends to follow the development of space technology and geopolitical events.”¹⁰⁰ Gabrynowicz cites the Soviet Union’s launching of Sputnik in 1957 as one of the catalysts for the National Aeronautics and Space Act of 1958, which established NASA. In the 1960s, the use of communications satellites led to the Communications Satellite Act of 1962. The Comsat Act was motivated by both Cold

⁹⁷ Juasentuliyana, “The Law Making Process in the United Nations.”

⁹⁸ Meyer, “The CR and PAROS, A Short History,” 3.

⁹⁹ Juasentuliyana, “The Law Making Process in the United Nations.”

¹⁰⁰ Joanne Gabrynowicz, “One Half Century and Counting: The Evolution of U.S. National Space Law and Three Long-Term Issues,” *Harvard Law and Policy Review* 4 (2010): 403, <http://joannegabrynowicz.com/wp-content/uploads/2013/11/2010-Gabrynowicz-HLPR-4.2-405-426-US-Space-Law.pdf>.

War motives and the lucrative potential of space-based communications.¹⁰¹ In 1968 an international treaty called the Rescue Agreement outlined the parties' obligations to take every measure to rescue an astronaut in distress and return them to the launching state.¹⁰² The 1960s ended with the Mercury, Gemini, and Apollo programs (the last of these culminating with the Moon landings humans).¹⁰³

In the 1970s, the United States was preoccupied with Vietnam, Watergate, international terrorism, and crude oil shortages. However, the international community introduced three additional space treaties:

1. The Liability Convention of 1972 established that a "launching State shall be absolutely liable to pay compensation for damages caused by its space object;" additionally, the treaty laid out the procedures for the settlement of claims for damages.¹⁰⁴
2. The Registration Convention of 1976 established that states launching objects had a responsibility to provide a means to assist in identifying space objects.¹⁰⁵

¹⁰¹ Gabrynowicz, "One Half Century and Counting," 409.

¹⁰² United Nations General Assembly (UN), RES/2345 (22), Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 22nd session, December 1968, https://www.unoosa.org/oosa/oosadoc/data/resolutions/1967/general_assembly_22nd_session/res_2345_xxii.html.

¹⁰³ Gabrynowicz, "One Half Century and Counting."

¹⁰⁴ UN, 2777 (26), 2.

¹⁰⁵ United Nations General Assembly (UN), RES 3235 (29), Convention on Registration of Objects Launched into Outer Space, 29th session, November 1974, https://www.unoosa.org/oosa/oosadoc/data/resolutions/1974/general_assembly_29th_session/res_3235_xxix.html.

3. The Moon Agreement was adopted in 1979 by the General Assembly but did not enter into force until 1984. The Moon agreement elaborates on the OST that the moon and other celestial bodies should be used “exclusively for peaceful purposes,” and their environments should not be disrupted. Any resources from the Moon are the common heritage of mankind.¹⁰⁶

The United States is a party to the Rescue Agreement and the Registration Convention, however, the US is not a party to the Moon Agreement. China and Russia are also not a party to the Moon Agreement.¹⁰⁷ To date, only eighteen nations have ratified the treaty, and four additional countries are signatories.¹⁰⁸ The US’ position as to why it did not become a member of the Moon Agreement was influenced by business and scientific communities fearing the treaty would prohibited commercial development. According the National Space Society, critics designated the treaty as “a giveaway of unprecedented proportions.”¹⁰⁹ While the Carter administration was in favor of

¹⁰⁶ United Nations General Assembly (UN), A/RES/34/68, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 34th session, December 1979, 78, https://www.unoosa.org/oosa/oosadoc/data/resolutions/1979/general_assembly_34th_session/res_3468.html.

¹⁰⁷ Michael Listner, “The Moon Treaty: Failed International Law or Waiting in the Shadows,” *The Space Review*, October 24, 2011, <https://www.thespacereview.com/article/1954/1>.

¹⁰⁸ United Nations General Assembly (UN), Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, New York, December 5, 1979, https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXIV-2&chapter=24&clang=_en.

¹⁰⁹ National Space Society, “L5 News: UN Moon Treaty Falling to U.S. Opposition Groups,” March 1982, <https://space.nss.org/l5-news-un-moon-treaty-falling-to-us-opposition-groups/>.

approving the treaty, the Reagan administration did not submit the treaty to the Senate, nor did President Ronald Reagan sign the treaty.¹¹⁰ A further concern (which is often a theme in treaties) was that smaller countries could stop countries or companies from developing the Moon and space in general.¹¹¹

The 1980s did not see any new international space law treaties specifically addressing the use of space for peaceful purposes; however, commercial interests dominated space governing proposals. The first major UN non-binding resolution concerning space commercialization was the Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting.¹¹² This Resolution established the sovereign rights of states concerning broadcasting from space-based assets. This included the principles of non-intervention, free dissemination and mutual exchange of information, assistance in educational and science fields and enhanced the qualities of life of all people with respect to the political and cultural

¹¹⁰ National Space Society, “L5 News.”

¹¹¹ Ibid.

¹¹² United Nations General Assembly (UN), 37/92, Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, December 10, 1982, <https://www.unoosa.org/oosa/en/ourwork/spacelaw/principles/dbs-principles.html>.

integrity of States..¹¹³ The Resolution acknowledged the applicability of international law, including the OST..¹¹⁴

The second major UN resolution adopted in the 1980s concerning commercial applications was the *Principles Relating to Remote Sensing of the Earth from Outer Space*..¹¹⁵ The principles of this Resolution include using remote sensing for all countries' interests, irrespective of their degree of economic, social, scientific, and technological development, while taking into account the needs of developing countries..¹¹⁶ This resolution required that activities be conducted with all States and people's full and permanent sovereignty over their wealth and natural resources..¹¹⁷ This Resolution also acknowledges that activities related to remote sensing shall be conducted in accordance

¹¹³ United Nations (UN), "United Nations Treaties and Principles on Outer Space: Text and Status of Treaties and Principles Governing the Activities of States in the Exploration and Use of Outer Space, Adopted by the United Nations General Assembly," *Documents on Outer Space Law* 18 (1999), <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1018&context=spacelawdocs>.

¹¹⁴ The United States opposed the resolution, noting that no special regulation of direct broadcast was appropriate and disputes should be resolved by existing international law. Louis de Gouyon Matigon, "Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television," *Special Legal Issues*, July 23, 2019, <https://www.spacelegalissues.com/principles-governing-the-use-by-states-of-artificial-earth-satellites-for-international-direct-television-broadcasting/>.

¹¹⁵ United Nations General Assembly (UN), 41/65, *Principles Relating to Remote Sensing of the Earth from Outer Space*, United Nations General Assembly, December 3, 1986, <https://www.unoosa.org/oosa/en/ourwork/spacelaw/principles/remote-sensing-principles.html>.

¹¹⁶ *Ibid.*

¹¹⁷ *Ibid.*

with the principles of the OST.¹¹⁸ The General Assembly has not voted on this Resolution.¹¹⁹

In February 1988, President Reagan released a Presidential Directive on National Space Policy (NSP).¹²⁰ The directive affirmed the use of space for peaceful purposes. The document acknowledged the United States as a leader in space, although recognized that there was increasing competition in space. The United States was required to be the preeminent leader in key areas of space critical to national security, scientific, technical, economic, and foreign policy goals.¹²¹ The directive did not discuss war fighting capabilities in space.

In 1981, the Soviet Union introduced a resolution to the UNGA to prevent an arms race in space, referred to now as PAROS. Since this treaty proposal is still being debated within the UN Conference on Disarmament, it will be reviewed in section three of this literature review as a current proposal to govern military activities in space.¹²²

No additional space governing treaties were adopted in the 1990s, although treaties and non-binding resolutions were proposed that affected space. The Strategic Arms Reduction Treaty, known as START I was signed in 1991 by the United States and

¹¹⁸ UN, 41/65.

¹¹⁹ Ibid.

¹²⁰ Office of the Press Secretary, “Presidential Directive on National Space Policy,” (Fact Sheet, The White House, Washington, DC, February 11, 1998), https://aerospace.org/sites/default/files/policy_archives/National%20Space%20Policy%20Feb88.pdf.

¹²¹ Ibid.

¹²² Meyer, “The CR and PAROS, A Short History,” 1.

the Soviet Union.¹²³ This treaty limited the number of ICBMs, and nuclear warheads either country could possess.¹²⁴ This treaty did not acknowledge the OST even though ICBMs travel through space, but it did seek to reduce the outbreak out of nuclear war and strengthen international peace.¹²⁵

In 1992, the UNGA adopted a resolution titled: Principles Relevant to the Use of Nuclear Power Source in Outer Space.¹²⁶ This resolution did not seek to ban the use of nuclear power in space, but to ensure states launching space objects take every measure necessary to protect people, populations, and the biosphere against radiological hazards.¹²⁷ The General Assembly adopted this resolution without a vote.

In 1996, a non-binding resolution was introduced to ensure developing countries still had a share in what the OST declared a “province of all mankind.”¹²⁸ This resolution

¹²³ James Martin Center for Nonproliferation Studies, “Treaty between the United States and the Union of Soviet Socialist Republics on Strategic Offensive Reductions (START I),” Nuclear Threat Initiative, last updated October 26, 2011, <https://www.nti.org/learn/treaties-and-regimes/treaties-between-united-states-america-and-union-soviet-socialist-republics-strategic-offensive-reductions-start-i-start-ii/>.

¹²⁴ Minuteman Missile National Historic Site, “Strategic Arms Reduction Treaty of 1991,” National Park Service, U.S. Department of the Interior, accessed October 12, 2020, <https://www.nps.gov/articles/start-treaty-1991.htm>.

¹²⁵ Treaty between the United States of America and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms, Moscow, July 31, 1991, <https://www.acq.osd.mil/asda/iipm/sdc/tc/start1/START1text.htm>.

¹²⁶ United Nations General Assembly (UN), A/SPC/47/L.6, Principles Relevant to the Use of Nuclear Power Source in Outer Space, 47th session, October 28, 1992, <https://digitallibrary.un.org/record/153304?ln=en#record-files-collapse-header>.

¹²⁷ Ibid.

¹²⁸ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (UN).

recognized a significant gain in space development by the spacefaring nations, but that smaller nations were getting left behind. The resolution did not seek to limit states from exploring space, however, it served as a reminder that space cannot be appropriated to a small minority of states. This resolution was adopted without a vote.¹²⁹

In 1996, President Bill Clinton released a NSP. While the policy was largely devoted to organizational functions between various US agencies, the policy acknowledged the peaceful purposes principle of the OST.¹³⁰ The policy also affirmed the US' position that defense and intelligence-related activities were permissible in space.¹³¹ This policy did not consider war fighting functions or space as a warfighting domain, nor did it discuss any adversarial or hostile actions from other nations.¹³²

In summary, the 1970s through the late 1990s saw three additional space law treaties, significant space exploration by the United States and the Soviet Union and the rapid commercialization of space.

¹²⁹ United Nations General Assembly (UN), A/RES/51/122, Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interests of All States, Taking into Particular account the Needs of Developing Countries, 51st session, December 13, 1996, https://www.unoosa.org/oosa/oosadoc/data/resolutions/1996/general_assembly_51st_session/ares51122.html.

¹³⁰ National Security and Technology Council, "National Space Policy," (Fact Sheet, The White House, September 19, 1996), <https://history.nasa.gov/appf2.pdf>.

¹³¹ Ibid.

¹³² Ibid.

Section 2

This section reviews the US Space policies from the early 2000s to 2020 and written works to analyze how the United States concluded that space is a warfighting domain. This section will include a review of the Commission to Assess United States National Security Space Management and Organization, the National Security Strategy, the National Space Strategy, The Defense Space Strategy and the US Space Force doctrine as well as other US government documents concerning space. This section will also review newspaper and journal articles written on the US Space Command and the US Space Force.

In 2001, the Commission to Assess United States National Security Space Management and Organization released a report mandated by Congress to address changes that would strengthen United States national security in the near, medium, and long term.¹³³ While the commission did not describe space as a warfighting domain, the report acknowledges that the US' economic well-being and security depended on the nation's ability to operate successfully in space.¹³⁴ The commissioners pointed out that they “appreciate the sensitivity that surrounds the notions of weapons in space for

¹³³ Commission to Assess United States National Security Space Management and Organization, *Report of the Commission to Assess United States National Security Space Management and Organization* (Washington, DC: U.S. Congress, House of Representatives, January 11, 2001), xii, <https://www.hsdl.org/?abstract&did=764>.

¹³⁴ *Ibid.*, 9.

offensive and defensive purposes” but to ignore the issue would be a “disservice to the nation.”¹³⁵

The Commission also recommended the US Government should vigorously pursue options to ensure the President has the option to deploy weapons in space to deter threats and defend against attacks on US interests.¹³⁶ The commission pointed out that the peaceful purposes principle of the OST was interpreted by the US to mean “non-aggressive” and that both self-defense and non-aggressive military use of space is allowed.¹³⁷ The report also suggested that a Space Corps within the Department of the Air Force may be an appropriate model similar to the Army Air Corps or the Marine Corps to be responsible for planning, programming and budgeting for space systems.¹³⁸ While the report did not advocate for a separate military branch, the report acknowledges the timetable to establish a space corps would be dictated by circumstances over the next five to ten years. The report concluded that it was in the US national interest to promote the peaceful use of space while developing and deploying the means to deter and defend against hostile acts directed at US space assets. The commission report also warned that the United States was an “attractive candidate for a Space Pearl Harbor.”¹³⁹ While this

¹³⁵ *Report of the Commission to Assess United States National Security Space Management and Organization*, 17.

¹³⁶ *Ibid.*

¹³⁷ *Ibid.*, 36.

¹³⁸ *Ibid.*, 81.

¹³⁹ *Ibid.*, xiii.

report did not label space a war fighting domain, it renewed the concern that space would be a possible place for conflict.

In 2006, President Bush released a NSP.¹⁴⁰ This policy re-affirmed the US commitment to exploring and using outer space for peaceful purposes and that defense and intelligence-related activities are permitted.¹⁴¹ The document also made a bold stance on the future of any legal limits placed on the United States. “The United States will oppose the development of new legal regimes or other restrictions that seek to prohibit or limit US access to 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 US National Interests.”¹⁴² President Bush’s strong language made it clear that the United States was unwilling to negotiate any new governing provisions that limit US use of space.¹⁴³

Five years later, President Barack Obama released the National Space Policy of the United States of America.¹⁴⁴ Similar to previous presidential policies, the document acknowledged the peaceful purposes principle in the OST and re-affirmed the US stance

¹⁴⁰ George W. Bush, *United States National Space Policy* (Washington, DC: The White House, August 31, 2006), https://history.nasa.gov/ostp_space_policy06.pdf.

¹⁴¹ Ibid., 1.

¹⁴² Ibid., 2.

¹⁴³ Ibid.

¹⁴⁴ Barack H. Obama, *National Space Policy of the United States of America* (Washington, DC: The White House, June 2010), https://history.nasa.gov/national_space_policy_6-28-10.pdf.

that peaceful purposes included national and homeland security activities.¹⁴⁵ The words “war” or “warfighting” are not found within the document; however, the document starts to hint at irresponsible behavior in space causing concern for all nations that rely on space. The policy specifically highlights decades of space activity that has littered space with debris, and additional ventures that increase the likelihood of a collision, loss, and even further debris.

While the concern of space debris has always been an issue, this statement is likely a very diplomatic way of pointing the finger at China’s January 2007 ASAT weapon destruction of a derelict Chinese weather satellite. This aggressive action in space left approximately 2,600 pieces of trackable debris floating in space, any of which could destroy another satellite in orbit.¹⁴⁶ In February 2008, the United States demonstrated its ability to shoot down a satellite as well in an operation named “Burnt Frost.” The US Navy fired an SM-3 missile from the USS Lake Erie to destroy a 2006 spy satellite that was deemed a failure immediately after launched when it lost contact with ground stations.¹⁴⁷ The satellite was destroyed, however, due to the altitude, space debris was minimal and all of it burnt up after 40 days, unable to survive re-entry into

¹⁴⁵ Obama, *National Space Policy of the United States of America*, 3.

¹⁴⁶ David Koplow, “ASAT-isfaction: Customary International Law and Regulation of Anti-Satellite Weapons,” *Michigan Journal of International Law* 30, no. 4 (Summer 2009): 1203, <https://repository.law.umich.edu/cgi/viewcontent.cgi?article=1141&context=mjil>.

¹⁴⁷ Nicole Petrucci, “Reflections on Operation Burnt Frost,” *Air Power Strategy*, March 7, 2017, <https://www.airpowerstrategy.com/2017/03/05/burnt-frost/>.

earth's atmosphere. The US demonstrated it could also destroy a satellite, but with significant less space debris.

One year after President Obama released the NSP, the DoD and the Director of National Intelligence released an unclassified summary of the National Security Space Strategy.¹⁴⁸ Once again, the document started with an acknowledgment that the US would promote the responsible, peaceful, and safe use of space, as the “foundational step to addressing the congested and contested space domain and enabling other aspects of our approach.”¹⁴⁹ The US recognized space was increasingly contested in all orbits and highlighted a range of “man-made threats that may deny, degrade, deceive, disrupt or destroy assets.”¹⁵⁰

The strategy also recognized the need for deterrence with a multilayered approach. One part of this approach was a departure from the 2006 policy, which opposed new legal regimes or other restrictions. The 2011 strategy stated the US will support establishing international norms primarily to promote spaceflight safety and dissuade and impose international costs on aggressive behavior.¹⁵¹ While not overtly stated, this language indicated the US was open to a possible space code of conduct or other agreed-upon rules that could be used to hold aggressive behavior in check. The

¹⁴⁸ Department of Defense and Director of National Intelligence (DOD and DNI), *National Security Space Strategy, Unclassified Summary* (Washington, DC: Government Printing Office, January 2011), https://www.dni.gov/files/documents/Newsroom/Reports%20and%20Pubs/2011_nationalsecurityspacestrategy.pdf.

¹⁴⁹ Ibid., 5.

¹⁵⁰ Ibid., 3.

¹⁵¹ Ibid., 13.

strategy also called for the US to strengthen defensive measures by improving the capability to deny “meaningful operational benefits from such attacks.”¹⁵² As in all previous policies and strategies, the United States retained the right and capabilities to respond in self-defense, should deterrence fail.¹⁵³

President Obama’s 2015 NSS did not directly advocate for a change in space laws; however, it did state the United States was expanding international space cooperation.¹⁵⁴ Space cooperation included promoting transparency and confidence-building measures such as an International Code of Conduct on Outer Space Activities.¹⁵⁵ While the strategy does not identify the terms of a code of conduct, it indicated the US was open to additional regulations concerning space use. The strategy also indicated a concern that space technology could be attacked, and that space security is vital to space systems that allow the world to navigate, communicate, and conduct commerce.¹⁵⁶

¹⁵² DOD and DNI, *National Security Space Strategy, Unclassified Summary*, 13.

¹⁵³ *Ibid.*, 10.

¹⁵⁴ Barack H. Obama, *National Security Strategy* (Washington, DC: The White House, 2015), 13, https://obamawhitehouse.archives.gov/sites/default/files/docs/2015_national_security_strategy_2.pdf.

¹⁵⁵ *Ibid.*

¹⁵⁶ *Ibid.*

President Trump's 2017 NSS mentions space several times when listing the operational domains of air, land, sea, space, and cyberspace.¹⁵⁷ Without directly naming China, the strategy notes other countries are pursuing weapons capable of attacking space assets, such as ASAT weapons. The strategy warned that any harmful interference that "directly affects this vital US interest will be met with a deliberate response at a time, place, manner, and domain of our choosing."¹⁵⁸ This statement indicated that a response from the US might come through a domain other than space.

While the 2017 NSS did not mention reactivating US Space Command or a separate military branch for space, both of those came ideas came to full fruition within two years of the strategies release. As described in chapter 1 of this thesis, US Space Command was reactivated as a geographic combatant command on December 18, 2018. Less than two months later, President Trump established the US Space Force, although it took almost another year for Congress to approve the Space Force through the 2020 National Defense Authorization Act.

As discussed in chapter 1, the DoD released the NDSS in June 2020. Shortly after the NDSS was released, the US Space Force released its first doctrine in August 2020.¹⁵⁹

¹⁵⁷ Donald J. Trump, *National Security Strategy of the United States of America* (Washington, DC: The White House, December 2017), 31, <https://trumpwhitehouse.archives.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905-2.pdf>.

¹⁵⁸ Donald J. Trump, *National Space Policy for the United States of America* (Washington, DC: The White House, December 2020, <https://trumpwhitehouse.archives.gov/wp-content/uploads/2020/12/National-Space-Policy.pdf>.

¹⁵⁹ Headquarters United States Space Force, *Spacepower*.

In line with the NDSS, the doctrine makes it clear the US considers space a warfighting domain. Despite the rapid, overt recognition that space is now a warfighting domain, efforts have been made for decades to regulate the use of space to avoid it from escalating into a battlefield.

On December 9, 2020, President Trump released the NSP.¹⁶⁰ The policy reaffirmed the principles of the OST and for nations to act responsibly in space to maintain stability, safety, security and long-term sustainability, while the US will continue to use space for national security activities including exercising the right of self-defense.¹⁶¹ The December 2020 policy also made it clear that purposeful interference with space systems, will be considered “an infringement of a nation’s rights” and the United States will respond to any attack with a “deliberate response at a time, place, manner, and domain of our choosing.”¹⁶² This is the latest space policy from the executive branch. As of May 7, 2021, President Joseph Biden has not published a space strategy; however, his interim national security strategic guidance states the US will “ensure the safety, stability, and security of outer space activities.”¹⁶³ The interim

¹⁶⁰ Trump, *National Space Policy*, 3.

¹⁶¹ Ibid.

¹⁶² Ibid., 4.

¹⁶³ Joseph R. Biden, *Interim National Security Strategic Guidance* (Washington, DC: The White House, March 2021), 17, <https://www.whitehouse.gov/wp-content/uploads/2021/03/NSC-1v2>.

guidance also states the US will lead in promoting shared norms on agreements for space.¹⁶⁴

Section 3

This section reviews the governing proposals from the space-faring nations of Russia, China, Canada, and the EU through the review of PAROS, PPWT, the proposed International Code of Conduct for Outer Space Activities, and the UK's proposal for a UN resolution to agree on responsible behavior in space.

In 1981, the UN General Assembly introduced PAROS.¹⁶⁵ The introduction recalled the OST's peaceful purpose requirement and was specifically concerned with the destabilizing effect ASAT systems could have on international peace and security. The General Assembly was convinced that further measures were needed to stop space from becoming an area of military conflict.¹⁶⁶ The UN assigned the task of working on PAROS to the Conference on Disarmament in order to prevent an arms race and keep with the spirit of the OST.¹⁶⁷ A second resolution requested the Conference on

¹⁶⁴ Ibid., 20.

¹⁶⁵ United Nations General Assembly (UN), A/RES/36/97, General and Complete Disarmament, Prevention of an Arms Race in Outer Space, 36th session, December 9, 1981, <https://undocs.org/en/A/RES/36/97>.

¹⁶⁶ Ibid.

¹⁶⁷ James Martin Center for Nonproliferation Studies, "Proposed Prevention of an Arms Race in Space (PAROS) Treaty," Nuclear Threat Initiative, last updated April 23, 2020, <https://www.nti.org/learn/treaties-and-regimes/proposed-prevention-arms-race-space-paros-treaty/>.

Disarmament negotiate a treaty that prohibited the placement of any weapons space..¹⁶⁸

The resolution was concerned that space would become an arena for an arms race and strain relations between States..¹⁶⁹

Over the next three decades, very little progress was made on developing a treaty. The ad hoc committee assigned PAROS discussed confidence-building measures such as pre-launch activities, monitoring, and rules of the road measures..¹⁷⁰ However, these concepts were only a topic of discussion, the measures were not tested outside of the committee. There was still reluctance on the part of some states, such as the US, to prohibit the weaponization of space.

In 2002, Canada, China, and Russia submitted working papers with outlines of elements of a future international treaty to prevent the use of weapons in space..¹⁷¹ In 2008, China and Russia submitted a draft treaty to prevent the placement of weapons in outer space (PPWT). The draft PPWT recognized the peaceful purposes use of space, the

¹⁶⁸ Meyer, “The C.R. and PAROS, A Short History.”

¹⁶⁹ United Nations General Assembly (UN), A/RES/36/99, Conclusion of a Treaty on the Prohibition of the Stationing of Weapons of any Kind in Outer Space, 36th session, December 9, 1981, <https://digitallibrary.un.org/record/27062?ln=en>.

¹⁷⁰ Meyer, “The C.R. and PAROS, A Short History,” 3.

¹⁷¹ Ibid.

ever-creasing role in the development of mankind, and the prevention of weapons in space would avert a grave danger for international peace and security.¹⁷²

The draft PPWT is only four pages long. PPWT Article I contained definitions, including a weapon as “a device placed in outer space, based on any physical principle, which has been specially produced or converted to destroy, damage, or disrupt the normal functioning of objects in outer space, on the Earth or in the Earth’s atmosphere, or to eliminate a population or components of the biosphere which are important to human existence or inflict damage on them.”¹⁷³ A weapon is considered to be placed in space if it orbits the Earth at least once, or follows an orbit before leaving earth, or permanently located somewhere in space.¹⁷⁴ Under Article II, states party to the treaty will not place weapons in orbit, or install weapons on celestial bodies. The remainder of the draft treaty concerns procedural issues for amending, withdrawing, and settling disputes.

In addition to PAROS and the PPWT proposals, the EU initiated a draft code of conduct for outer space activities in 2008.¹⁷⁵ The code of conduct was not proposed as a

¹⁷² Christina Rocca, Letter dated 19 August 2008 from the Permanent Representative of the United States of America Addressed to the Secretary-General of the Conference Transmitting Comments on the Draft “Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects (PPWT)” as Contained in Document CD/1839 of 29 February 2008, United Nations Conference on Disarmament, August 26, 2008. https://digitallibrary.un.org/record/637449/files/CD_1847-EN.pdf.

¹⁷³ Rocca letter.

¹⁷⁴ Ibid.

¹⁷⁵ Council of the European Union, *Council Conclusions and Draft Code of Conduct for Outer Space Activities* (European Union, 17175/08, PESC 1697, CODUN 61, December 17, 2008), <https://data.consilium.europa.eu/doc/document/ST-17175-2008-INIT/en/pdf>.

treaty; instead, it is a voluntary commitment to behaviors as a first step towards a binding treaty.¹⁷⁶ The goal of the code of conduct is to strengthen existing treaties and to codify best practices regarding security, safety, and sustainable space activities. The code reaffirms the peaceful use of space under the OST, and requires members to take “all appropriate measures to prevent outer space from becoming an area of conflict.”¹⁷⁷ Other rules for conduct include notification for dangerous activity, operate in good faith to avoid interfering with space activities, minimize the risk of collision and mitigating space debris impact.

In August 2020, the United Kingdom called for a resolution to avoid conflict in space.¹⁷⁸ The purpose was to “broker an international consensus on responsible behavior in space.”¹⁷⁹ Themes addressed in the press release included a concern for the use of ASATs, military threats that disrupt civilian use of space technology, and to build trust and confidence to prevent an arms race with catastrophic consequences. On December 7, 2020, the UNGA adopted the resolution encouraging member states to study threats and security risks and characterize actions considered responsible or threatening

¹⁷⁶ Sergio Marchisio, “The Draft Code of Conduct for Outer Space Activities,” (United Nations/Thailand Workshop on Space Law, Bangkok, Thailand, November 16-19, 2010), <https://www.unoosa.org/pdf/pres/2010/SLW2010/02-10b.pdf>.

¹⁷⁷ European External Action Service, *International Code of Conduct for Outer Space Activities* (Draft), 4.

¹⁷⁸ Foreign and Commonwealth Office, “UK Push for Landmark UN Resolution to Agree Responsible Behaviour in Space.”

¹⁷⁹ *Ibid.*

international security.¹⁸⁰ Under the resolution, member States are supposed to submit views on the resolution at the General Assembly seventy-sixth session, currently scheduled for September 14, 2021.¹⁸¹

On October 13, 2020, eight nations, including the United States, signed bilateral agreements with the United States known as the Artemis Accords.¹⁸² The accords focus on international cooperation on and around the moon and establish principles to explore for peaceful purposes, transparency, inter-operability, registering space objects, de-conflict activities and safely dispose of orbital debris.¹⁸³ While the accords are not legally binding, they are a set of agreements on the use of space for future endeavors. According to NASA administrator Jim Bridenstine, the bilateral agreements between the US and the other nations allowed the initiative to move much faster than seeking a multilateral agreement with the UN.¹⁸⁴ Frans von der Dunk, a professor of space law, sees the accords as a starting point for other nations to initiate similar agreements. These

¹⁸⁰ UN, A/RES/75/36, 3.

¹⁸¹ United Nations (UN), “What are the Opening Dates of Forthcoming Regular Session of the UN General Assembly and of the General Debate,” DAG Hammarskjöld Library, accessed April 15, 2021, <https://ask.un.org/faq/14598>.

¹⁸² The Artemis Accords, Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes, US-UK-UAE-Luxembourg-Japan-Italy-Canada-Australia, October 13, 2020, <https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf>.

¹⁸³ Sean Potter and Cheryl Warner, “NASA, International Partners Advance Cooperation with First Signings of Artemis Accords,” NASA, October 13, 2020, <https://www.nasa.gov/press-release/nasa-international-partners-advance-cooperation-with-first-signings-of-artemis-accords>.

¹⁸⁴ Jeff Foust, “Eight Countries Sign Artemis Accords,” *Space News*, October 13, 2020, <https://spacenews.com/eight-countries-sign-artemis-accords/>.

agreements could eventually lead to international regulations, similar to how current international aviation regulations began as bilateral agreements.¹⁸⁵

¹⁸⁵ Frans von der Dunk, Professor of Space Law at the University of Nebraska, quoted in Foust, “Eight Countries Sign Artemis Accords.”

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

Research for this topic focused on the primary question: Are the space treaty proposals and recommended codes of conduct a valid solution to govern space as a warfighting domain? The question emerges from the problem statement: The OST is not sufficient to govern space as a warfighting domain. After chapter 1 identified why the OST lacked the ability to govern space as a warfighting domain, two possible solutions to govern space emerged. The first option is to draft and implement new treaties or codes of conduct to supplement the OST. The second option is to rely on current international law such as the LOAC that could govern military operations in space even though it is not space specific.

The primary sources in this research consisted of the current space treaties and the proposed treaties and codes of conduct. These were examined to review what gaps in the OST each of the proposals are trying to fill. While the proposals were briefly covered in chapter 2, an in-depth analysis of the proposals will be performed in chapter 4. Next, additional primary sources, such as US space policy, doctrine, and statements from the executive branch from the 1960s to the present were examined to provide a historical background and to determine what position the US and other space-faring nations were likely to take on a given proposal. Finally, secondary sources, including law review journals, industry publications, and news articles touching on the topic of space governance were analyzed to provide further evidence of a proposal's likelihood of success. After the first research question was answered, the second research question,

“are the current space treaties, combined with LOAC, sufficient to govern space as a warfighting domain?” was analyzed using the same approach as the first question.

Method Selection

According to researcher Dr. John Creswell, one of the preliminary considerations for research is to select an appropriate approach.¹⁸⁶ Research approaches move beyond broad assumptions and detail the methods of data collection, analysis, and interpretation.¹⁸⁷ There are three approaches to research Creswell identifies: qualitative, quantitative, and mixed methods.¹⁸⁸ The difference between qualitative research and quantitative research is often framed as words (qualitative) versus numbers (quantitative). Qualitative research uses open-ended questions, using descriptions and observations, while quantitative research uses closed-ended questions and uses statistics and data.¹⁸⁹ The mixed method research involves collecting and integrating quantitative and qualitative data. This research will use the qualitative methodology since the question for this research is open ended: Are the space treaty proposals and recommended codes of conduct a valid solution to govern space as a warfighting domain? Figure 1 provides a graphic representation of the research approach in this thesis.

¹⁸⁶ John W. Creswell, *Research Design: Qualitative, Quantitative and Mixed Method Approaches*, 4th ed. (Thousand Oaks, CA: Sage, 2014), 29.

¹⁸⁷ Ibid., 32.

¹⁸⁸ Ibid.

¹⁸⁹ Ibid.

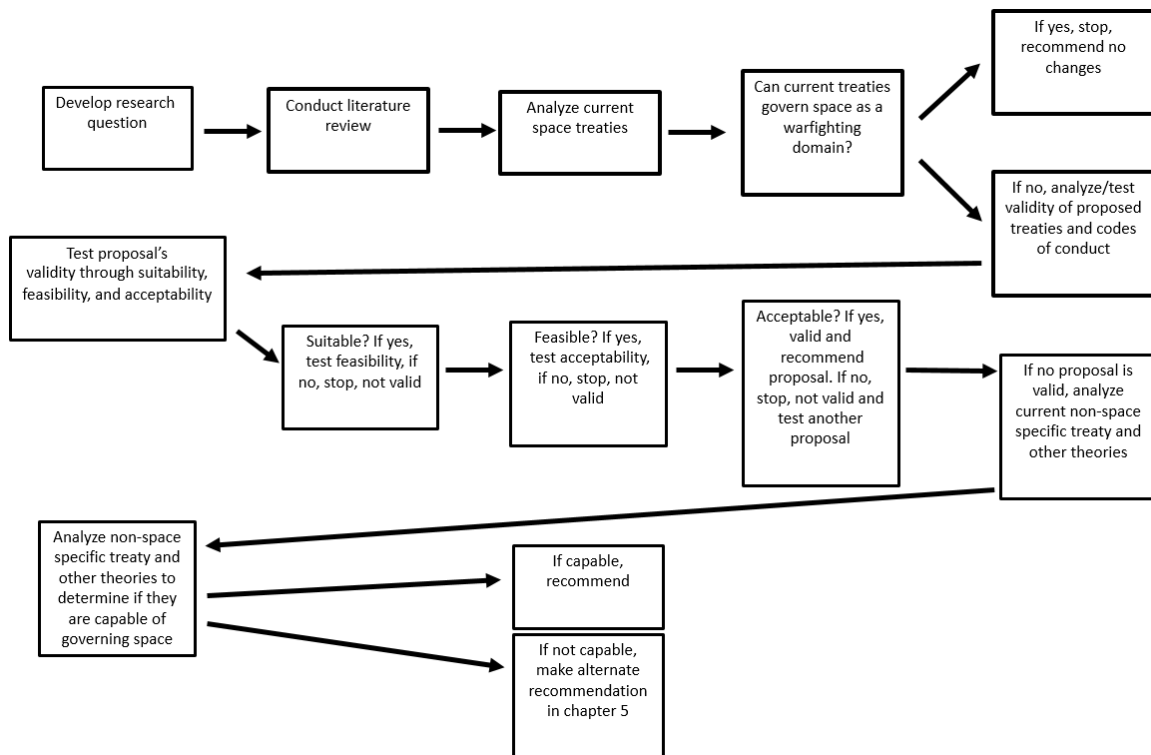


Figure 1. Methodology

Source: Created by author.

Qualitative Approaches to Inquiry

Within the qualitative research methodology, there are five approaches to inquiry: narrative research; phenomenological research; grounded theory research, ethnographic research, and case study research.¹⁹⁰ This research implemented the case study approach. The case study approach “investigates a contemporary phenomenon in-depth within its real-life context, especially when the boundaries between the phenomenon and the

¹⁹⁰ Creswell, *Research Design*, 69.

content are not clearly evident.”¹⁹¹ It is used to develop a holistic account to develop a complex picture of the problem and involves multiple perspectives and many factors involved in a situation.¹⁹² Case study was chosen for this research, because in general, developing treaties is complicated and takes years, even decades to accomplish. Studying weapons in space and using space as a warfighting domain is also complex. Combining the two to achieve a codification requires a holistic approach to explore possible solutions which satisfy stakeholders.

Critics of case study argue it lacks proper sample size and does not provide verified results.¹⁹³ Without a proper sample size, case study is susceptible to the personal bias of the researcher.¹⁹⁴ This is a fair critique of the method used in this research since the sample size is small. There are only five UN treaties directly addressing the use of space, two proposed resolutions for treaties to govern weapons in space, and two proposed codes of conduct. However, a sample size any larger does not exist within space law. Further, if a larger sample size were to develop, it would lead to a diffusion of solutions where each party with a proposal would become more entrenched with their proposal instead of negotiating the terms of the already proposed options.

¹⁹¹ R. K. Yin, *Case Study Research: Design and Methods*, 5th ed. (Thousand Oaks, CA: Sage, 2014), quoted in Aikaterni Argyrou, “Making the Case for Case Studies in Empirical Legal Research,” *Utrecht Law Review* 13, no. 3 (December 2017): 100.

¹⁹² Argyrou, “Making the Case for Case Studies in Empirical Legal Research,” 102.

¹⁹³ *Ibid.*

¹⁹⁴ *Ibid.*

Despite critiques of the case study approach, it provided the broadest opportunity of the five approaches to address solutions for space governance. The second most relevant approach is the phenomenological approach. It provided a secondary means of understanding international legal concepts. Phenomenological research describes the common meaning for several individuals of lived experiences of a concept or a phenomenon.¹⁹⁵ This approach applies to space law because treaties are often based on customary law and shared principles. Customary international law is derived from a “general and consistent practice” by states that follow a sense of legal obligation, even though a specific practice is not codified.¹⁹⁶ These shared principles guide States when developing space policy into laws. Phenomenological research contributed to the understanding customary law plays in developing treaties.

The three additional approaches under qualitative studies were not suited as a primary method of inquiry for this study. The narrative research approach reviews collections of stories from individuals about lived and told experiences.¹⁹⁷ No research was performed to review stories from individuals concerning the development of space law. Grounded theory study research emphasizes common experiences for a number of individuals. Once gathered, this experience seeks to generate a “unified theoretical

¹⁹⁵ Creswell, *Research Design*, 82.

¹⁹⁶ Legal Information Institute, “Customary International Law,” Cornell Law School, accessed May 4, 2021, https://www.law.cornell.edu/wex/customary_international_law.

¹⁹⁷ Creswell, *Research Design*, 69.

explanation” for a process or action.¹⁹⁸ This research approach is not suited to examine space law in this thesis because the thesis does not focus on individuals, however, space law began with a shared understanding that space belonged to all mankind for peaceful purposes. Finally, ethnographic research is interested in examining shared patterns of belief, behavior, and language.¹⁹⁹ This research is appropriate for studying cultures and societies, but is too narrow to encompass space law, other than a slight resemblance to phenomenological research providing an understanding of how customary international law develops over time into treaties.

Of the five approaches, case study was selected because it provided an opportunity to compare the OST, the proposed treaties and codes of conduct and international laws that are not space specific. It was also used to review policy, doctrine, and statements made by presidential administrations to develop an understanding of where the United States stands in regard to space governance from the 1960s to today. The case study method also enabled an evaluation of the validity of the proposals by reviewing each through a test examining likelihood of success.²⁰⁰

Validity was determined using Army War College Professor and retired Colonel Art Lykke’s method of evaluating strategies. To evaluate a proposed strategy, Lykke tests

¹⁹⁸ Creswell, *Research Design*, 83.

¹⁹⁹ *Ibid.*, 90.

²⁰⁰ Argyrou, “Making the Case for Case Studies in Empirical Legal Research,” 102.

if the logic fits to achieve the desired end state.²⁰¹ Dr. Harry Yarger of the Army War College expanded on Lykee's work by developing three screening criteria to test a strategy's validity: suitability, feasibility, and acceptability.²⁰² The first of these three screening criteria is suitability. Suitability examines the strategy's ability to "accomplish the desired end."²⁰³ The second criteria is feasibility, which seeks to determine if the action can be performed using "the means available."²⁰⁴ The third criteria is acceptability, which examines if the "consequences of cost are justified by the importance of the desired effect."²⁰⁵ While these screening criteria are typically applied to testing the validity of a military strategy, they were applied in this thesis to determine if the end state of governing warfighting in space could be accomplished through the proposals.

²⁰¹ Harry Yarger, *Strategic Theory for the 21st Century: The Little Book on Big Strategy* (Carlisle, PA: U.S. Army War College, Strategic Studies Institute, February 2006), 7, <https://apps.dtic.mil/dtic/tr/fulltext/u2/a444141.pdf>.

²⁰² Ibid., 16.

²⁰³ Harry Yarger, "Toward a Theory of Strategy: Art Lykke and the U.S. Army War College Strategy Model," in *U.S. Army War College Guide to National Security Issues, Volume I: Theory of War and Strategy*, 5th ed., ed. J. Boone Bartholomees, Jr. (Carlisle, PA: Strategic Studies Institute, 2012), 50, <https://ssi.armywarcollege.edu/2012/pubs/u-s-army-war-college-guide-to-national-security-issues-vol-1-theory-of-war-and-strategy-5th-ed/>.

²⁰⁴ Ibid.

²⁰⁵ Ibid.

Ethical Assurances

No research was conducted on living persons, and no persons were interviewed for this thesis. All documents used in this thesis are cited in footnotes and in the bibliography.

Summary

This thesis will use the qualitative research method. Within the qualitative research method, the approaches that will be used are case study, and content analysis. Proposed treaties will be examined through Lykee and Yarger's screening criteria of suitability, feasibility, and acceptability to determine if the proposal is valid.

CHAPTER 4

ANALYSIS

Should any adversary threaten to endanger the benefits we all derive from space, the United States will employ all elements of national power to deter and, if necessary, prevail over hostile activities in, from, and through space.

—President Donald J. Trump,
National Space Policy of the United States of America

The purpose of the research is to determine if the proposed space treaties and codes of conduct present a viable solution to govern space as a warfighting domain. In chapter 1, it became evident the OST is not sufficient to govern space as a warfighting domain since the OST requires space to be used for peaceful purposes. The analysis in this chapter will focus on the validity of the proposed treaties and codes of conduct and to analyze whether or not these proposals can sufficiently govern space if adopted by the three largest space-faring nations: China, Russia, and the United States. If the proposed treaties and codes are not valid, then current international space treaties combined with non-space specific treaties such as the LOAC will be examined to determine if the current body of laws is sufficient to govern space as a warfighting domain.

To begin analysis, a refresh of definitions pertaining to this topic is necessary. The US DoD does not have a definition of “warfighting domain,” but the DoD dictionary identifies the land, air, maritime cyberspace, and space domains. The space domain is defined as “The area surrounding Earth at altitudes of greater than or equal to 100 kilometers above mean sea level.”²⁰⁶ There is no agreed upon international or US

²⁰⁶ CJCS, *Dictionary of Military and Associated Terms*, 198.

definition of a space weapon, however, the proposed PPWT defines weapon in outer space as “any outer space object or its component produced or converted to eliminate, damage or disrupt normal functioning of objects in outer space, on the Earth’s surface or in the air, as well as to eliminate population, components of biosphere important to human existence, or to inflict damage to them by using any principles of physics.”²⁰⁷

This chapter will limit the validity standards of each proposal to the spacefaring nations of the China, Russia, and the United States. Validity will be determined by using Lykke’s model by examining if a proposal is suitable, feasible, and acceptable to the space-faring nations. Suitability examines if the proposal, if attained, accomplish the effect desired. Feasibility seeks to determine if the action can be accomplished using the means available. Acceptability examines if the consequences of cost are justified by the importance of the desired effect.²⁰⁸ Actions and statements made from the space-faring nations concerning the current proposals will be analyzed to determine if there is one proposal that might be able to reach a consensus and ultimately become a treaty. In the alternative to a new treaty, this chapter will also analyze if the current treaties and other governing sources, such as LOAC, eliminate the need for additional treaties and codes of conduct.

The first major proposal to update space law concerning weapons in space came in 1981 from the Soviet Union. The Soviet Union proposed a treaty to prohibit the

²⁰⁷ Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (Draft), MFA, PRC, Article I.

²⁰⁸ Yarger, “Toward a Theory of Strategy: Art Lykke and the U.S. Army War College Strategy Model,” 50.

placement of weapons in space and became known as PAROS.²⁰⁹ Russia argued this proposal was necessary because the OST only limited WMDs in orbit space and from placing weapons on the moon and other celestial bodies. The OST has a loophole for conventional weapons system that can be placed into orbit without being placed on a celestial body.²¹⁰ On December 9, 1981, the UNGA adopted resolution 36/99, requesting the Committee on Disarmament to form an ad hoc committee to begin negotiations with a view of archiving the Soviet Union's proposal.²¹¹

The desired end state for PAROS is a treaty which commits states to refraining from placing any type of weapon into orbit, installing weapons on celestial bodies, and threatening to use force against objects in outer space.²¹² Under Lykke's validity test, PAROS is suitable (with an asterisk) because if it becomes a treaty, it would prohibit signatories from placing weapons into space.²¹³ However, the asterisk means it would only apply to signatories, and thus, would fail to address the true desired end state in eliminating weapons in space. If one narrowly interprets PAROS's desired end state as only applying to signatories, then it would, in fact, be suitable. However, if the true end state is a world free from weapons in space, it would only be suitable if every nation

²⁰⁹ Meyer, "The CR and PAROS, A Short History," 1.

²¹⁰ *Ibid.*, 3.

²¹¹ UN, A/RES/36/99.

²¹² James Martin Center, "PAROS Treaty."

²¹³ *Ibid.*

capable of placing weapons into space signed the treaty and abided by the agreement.

This leaves PAROS in a situation where it is partially suitable.

The second step to determine if a proposal is valid is feasibility. Feasibility seeks to determine if the action can be performed using the means available. PAROS is feasible, in that a treaty can be finalized and entered into effect based on the terms of the treaty. States may sign treaties with as many parties that are willing to sign the treaty and the treaty becomes effective when desired by the parties. Further, there are currently no acknowledged weapons in space that would have to be removed under PAROS, therefore, execution of PAROS is relatively feasible.

The third step in the validity model is to determine if the proposal is acceptable, which examines if the consequences of cost justified by the importance of the effect desired. Since the Committee on Disarmament formed an ad-hoc committee in 1985 to explore PAROS, the United States has objected to PAROS believing that bi-lateral negotiations with the Soviet Union would be a better solution (at the time, the Soviet Union was the only other space-faring nation capable of placing weapons in space).²¹⁴ The view held by the US is possibly due to the lack of success with the 1984 Moon Treaty, which only has ratification from only 18 nations and does not include the US, Russia, or China.²¹⁵ The Moon Treaty reaffirmed the OST and prohibits hostile acts and military bases from being placed on the moon. Due to US objections, the ad-hoc

²¹⁴ Alumundena Azcarate Ortega, "Placement of Weapons in Outerspace: The Dichotomy between Word and Deed," *Lawfare*, January 28, 2021, <https://www.lawfareblog.com/placement-weapons-outer-space-dichotomy-between-word-and-deed>.

²¹⁵ UN, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.

committee on PAROS no longer convened after 1994.²¹⁶ While the United States has not publicly stated what specific costs would come if the US agreed to the proposed treaty, it can be inferred PAROS would cost the US a future opportunity the US is not willing to relinquish in the proposed treaty. Without support from the largest space faring nation, the PAROS proposal is not acceptable and therefore fails under the Lykke validity test.

China agreed with Russia arguing existing legal instruments were inadequate and “did not prevent launching into space and testing in space of conventional weapons as well as weapons based on new physical principles, such as lasers, very high frequency weapons, particle beam weapons and others.”²¹⁷ In 2008, China and Russia submitted a draft treaty to prevent weapons placement in outerspace, known as PPWT.²¹⁸ The four page draft initially defined weapon in outer space as “any device placed in outer space, based on any physical principle, which has been specially produced or converted to destroy, damage or disrupt the normal functioning of objects in outer space, on the Earth or the Earth’s atmosphere, or to eliminate a population or components of the biosphere which are important to the human existence or inflict damage on them.”²¹⁹ The US

²¹⁶ Ortega, “Placement of Weapons in Outerspace.”

²¹⁷ Meyer, “The CR and PAROS, A Short History,” 3.

²¹⁸ Ibid., 5.

²¹⁹ Valery Loshchinin and Wang Qun, Letter dated 12 February 2008 from the Permanent Representatives of the Russian Federation and the Permanent Representative of China to the Conference on Disarmament Addressed to the Secretary-General of the Conference Transmitting the Russian and Chinese Texts of the Draft “Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects (PPWT),” United Nations Conference on Disarmament, February 29, 2008, 3, <https://digitallibrary.un.org/record/633470?ln=en>.

immediately dismissed the PPWT as a “diplomatic ploy by the two nations to gain a military advantage.”²²⁰ US Ambassador Christina Rocca wrote a letter to the Conference on Disarmament, voicing the US objection to any prohibitions on the military’s use of space.²²¹

In 2014, Russia and China made minor updates to the proposed PPWT. This included an update to the definition of space weapon: the term “weapon in outer space” means “any outer space object or its component produced or converted to eliminate, damage or disrupt normal functioning of objects in outer space, on the Earth’s surface or in the air, as well as to eliminate population, components of biosphere important to human existence, or to inflict damage to them by using any principles of physics.”²²² A device is considered as “placed in outer space” when it orbits the Earth at least once, or follows a section of such an orbit before leaving this orbit, or is placed at any location in outer space or on any celestial bodies other than the Earth.”²²³ Despite the update, the US still dismissed the proposal as “fundamentally flawed.”²²⁴

²²⁰ US-China Economic and Security Review Commission, *Hearing on China in Space: A Strategic Competition?* Testimony before the U.S.-China Economic and Security Review Commission, submitted by Brian Weeden, April 25, 2019, 11, <https://www.uscc.gov/sites/default/files/Brian%20Weeden%20USCC%2025%20April.pdf>.

²²¹ Rocca letter, 8.

²²² Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (Draft), MFA PRC, Article I.

²²³ Loshchinin and Qun letter, 3.

²²⁴ Foust, “U.S. Dismisses Space Weapons Treaty Proposal as Fundamentally Flawed.”

Later in 2014, the US Ambassador to the UN Conference on Disarmament, Robert Wood, gave a speech and cited concerns with the PPWT including a lack of verification mechanisms and no restrictions on ASAT weapons on the ground.²²⁵ In 2019, Ambassador Wood reiterated the US objections to the PPWT, stating “the greatest threat to satellites is not from weapons in space, but rather ground based anti-satellite weapons that are designed to destroy, damage, or disrupt the normal functioning of objects in outer space.” Even though the PPWT prohibits the use of force against outer space objects, the US argues a nation could develop, test, and store ASAT weapons and still comply with PPWT. If a party to the treaty decided to use ASATs, it could simply withdraw from the treaty and have an arsenal of weapons ready to be deployed. Without measures to eliminate the ASAT threat, the US will not become a signatory to PPWT.

Under the Lykke validity standards, the PPWT fails for similar reasons PAROS fails. The PPWT is partially suitable. It could reach the desired end state if all states with space weapons capabilities signed the treaty; however, the US has made it clear it will not sign PPWT. Without the support of every state with a space weapons capability, the desired end state will not be accomplished. PPWT is feasible because it can be signed as a UN treaty. According to Article X of the proposed treaty, twenty nations must ratify to

²²⁵ US Permanent Representative to the Conference on Disarmament, *Statement by Ambassador Wood: The Threats Posed by Russia and China to Security of the Outer Space Environment*, Conference on Disarmament Plenary Meeting, Geneva, August 14, 2019, <https://geneva.usmission.gov/2019/08/14/statement-by-ambassador-wood-the-threats-posed-by-russia-and-china-to-security-of-the-outer-space-environment/>.

enter into force. Further, there are no state acknowledged²²⁶ weapons in space, therefore, the conditions set forth in PPWT already exist. However, PPWT is not acceptable, because the cost is not justified by the importance of the desired effect. The US finds the PPWT unacceptable because if executed, the cost would be a loophole for ground-based weapons development. At this time, neither PAROS nor the PPWT are valid strategies to eliminate the threat of weapons use that result in the destruction of objects in space. While the US has made it clear it will not agree to new treaties, in Ambassador Rocca's 2008 letter to the Committee on Disarmament, she indicated the US supports voluntary transparency and confidence building measures.²²⁷

In the same year as the PPWT was proposed, the EU proposed a draft International Code of Conduct for Outer Space Activities and provided updates to the proposed code in 2010 and 2014.²²⁸ The purpose of the code is described as “establishing transparency and confidence-building measures.”²²⁹ Unlike a treaty, the code is not

²²⁶ In December 2020, The United States claimed Russia has placed a weapon in space through a co-orbital ASAT. “Russia has made space a warfighting domain by testing space-based and ground-based weapons intended to target and destroy satellites.” – U.S. Army General James Dickinson, US Space Command, Commander. US Space Command Public Affairs, “Russia Tests Direct-Ascent Anti-Satellite Mission,” US Space Command, December 16, 2020, <https://www.spacecom.mil/News/Article-Display/Article/2448334/russia-tests-direct-ascent-anti-satellite-missile/>.

²²⁷ Rocca letter, 7.

²²⁸ Micah Zenko, “A Code of Conduct for Outer Space,” Council on Foreign Relations, November 30, 2011, <https://www.cfr.org/report/code-conduct-outer-space>; European External Action Service, “Draft International Code of Conduct for Outer Space Activities.”

²²⁹ European External Action Service, *International Code of Conduct for Outer Space Activities* (Draft), 3.

legally binding on member states and has no enforcement mechanisms. Within this thirteen-page code, states have the responsibility to use space for peaceful purposes without harmful interference and respecting the security, safety and integrity of space objects.²³⁰ The code allows military activities, but only to the extent the activities are promoting the peaceful exploration and use of outer space for the benefit of humankind and states must take all appropriate measures to prevent outer space from becoming an arena of conflict. The code also focuses on space debris management and the responsibility to refrain from situations that damage to space objects causes additional debris.

The Obama administration debated endorsing the EU code, however, members of Congress voiced concern the code could restrain missile defenses or ASATs.²³¹ Senator Jeff Sessions pointed out the US has advanced the furthest in space systems and codes of conduct tend to “constrain our military.”²³² In 2012, Ellen Taucher, Undersecretary of State for Arms Control and International Security, stated, “it’s been clear from the very beginning that we’re not going along with the code of conduct” and when asked why the US would not sign, Taucher replied “it’s too restrictive.”²³³

²³⁰ European External Action Service, *International Code of Conduct for Outer Space Activities* (Draft), 3.

²³¹ Zenko, “A Code of Conduct for Outer Space.”

²³² Marcus Weisgerber, “U.S. Wants Changes to EU Space Code of Conduct,” *Space News*, January 12, 2012, 2, <https://spacenews.com/18667us-wants-changes-to-eu-space-code-of-conduct/>.

²³³ *Ibid.*

In 2006, Russia introduced resolution 61/75²³⁴ in the UNGA, which invited member states to share their views on transparency and confidence building measures with regard to PAROS.²³⁵ While Russia encourages transparency and confidence building measures, Russia has remained relatively silent on the proposed EU Code, instead choosing to focus on the PPWT as a stronger solution to prevent weapons in space. China has not voiced support for the EU Code either, and similar to Russia, is pursuing the PPWT instead of advocating for the EU Code.²³⁶

Without the support of China, Russia, or the United States, the proposed EU Code also fails the Lykke validity standards. Since the proposed EU Code is not legally binding, its end state is simply to enhance the safety of outer-space activities. The EU Code is suitable to achieve its end state, but similar to PAROS and PPWT, it is only suitable if all spacefaring nations capable of threatening safety and security become signatories. The EU Code is feasible for the same reasons PAROS and PPWT are feasible, because it can be accomplished by using the means already available, although the EU code also needs metrics to determine if space is actually safer. However, the EU Code is not acceptable to the three largest spacefaring nations. The US has publicly stated

²³⁴ United Nations General Assembly (UN), A/RES 61/75, Transparency and Confidence-Building Measures in Outer Space Activities, 61st session, December 18, 2006, https://www.unoosa.org/pdf/gares/ARES_61_075E.pdf.

²³⁵ Wolfgang Rathgeber, Nina-Louisa Remuss, and Kai-Uwe Schrogl, “Space Security and the European Code of Conduct for Outer Space Activities,” (Disarmament Forum, 2009), 34, accessed May 13, 2021, https://www.peacepalacelibrary.nl/ebooks/files/UNIDIR_pdf-art2909.pdf.

²³⁶ Alexander Bowe, “China’s Position on a Code of Conduct in Space” (Staff Research Report, US China Economic and Security Review Commission, Washington, DC, September 2017), 2.

it will not sign, indicating the cost of restricting US advances in space is not justified. Russia and China will not sign the EU code, indicating the cost of signing may come at the expense of the PPWT.

In addition to the EU Code, the UK called for a resolution to avoid conflict in space through a UN resolution introduced in December 2020.²³⁷ The purpose is to “broker an international consensus on responsible behavior in space.”²³⁸ The press release included the use of ASATs and military threats that disrupt civilian use of space technology. On December 7, 2020, the UNGA adopted the resolution encouraging member states to study threats and security risks and characterize actions considered responsible or threatening international security.²³⁹ Under the resolution, member states are supposed to submit views on the resolution at the General Assembly seventy-sixth session, currently scheduled for September 14, 2021.²⁴⁰

The UK proposal was well received within the UN. One-hundred and sixty-four nations, including the United States, voted in favor of the resolution, however, China and Russia were among the twelve nations that voted against the resolution.²⁴¹ In February 2021, Maj. Gen. DeAnna Burt, US Commander of Combined Force Space Component

²³⁷ Foreign and Commonwealth Office, “UK Push for Landmark UN Resolution to Agree Responsible Behaviour in Space.”

²³⁸ Ibid.

²³⁹ UN, A/RES/75/36, 3.

²⁴⁰ UN, “What are the Opening Dates of Forthcoming Regular Session of the UN General Assembly and of the General Debate.”

²⁴¹ UN, A/RES/75/36, Voting Summary.

Command, indicated a team of Defense and State department officials were drafting language on the US position on the UK resolution.²⁴² Maj. Gen. Burt cited the problem with previous UN resolutions were they were non-binding, while hopeful that the US proposed language will result in a binding resolution. While it is too early to determine if the UK resolution will result in any meaningful changes in behavior related to space, early votes indicate China and Russia are likely to vote against any proposed code of conduct or treaty that is not the PPWT.

At this time, the UK Code also fails under the Lykke model. It is not suitable or feasible at this time because it is in the exploratory phase and does not have the proposed language solidified. It is also not acceptable at this time because China and Russia have already voted against the resolution, likely fearing the cost would lessen the possibility of the PPWT being signed.

After examining PAROS, PPWT, EU Code of Conduct, and the UK Code of conduct, it is clear there is not a consensus between China, Russia, and the US about the way forward in space. However, each nation has indicated they are interested in being a party to an agreement that furthers their own interest in space. For China and Russia, the primary interest is to get the United States to commit to not placing weapons in space. For the US, the primary interest is to eliminate China and Russia's ability to develop, stockpile and use ASATs against assets in space. While the proposed treaties and codes of conduct do not provide a valid solution at this time, perhaps the current treaties such as

²⁴² Sandra Erwin, "U.S. to Support International Effort to Set Rules of Behavior in Space," *Space News*, February 24, 2021, <https://spacenews.com/u-s-to-support-international-effort-to-set-rules-of-behavior-in-space/>.

the Moon Treaty, and the LOAC may provide a partial solution to governing space as a warfighting domain.

While the Moon Treaty is already in effect, it has not been signed by China, Russia, or the United States. The treaty has provisions that satisfy China and Russia's concern about preventing an arms race, although the treaty only addresses celestial bodies. Article III limits the use of the moon exclusively for peaceful purposes and prohibits the establishment of military bases, weapons testing, and military maneuvers.²⁴³ Articles IV and V of the Moon Treaty also have trust and confidence building measures, requiring nations that explore space to notify the international community and to share data results whenever possible. While the three largest space-faring nations are not parties to the treaty, it is still international law, and could over time, develop into customary law even if China, Russia, and the United States have not signed.

However, the United States has made it clear it will not sign the Moon Treaty nor will it consider the Moon Treaty customary law with regard to commercial interests. In April 2020, President Trump signed executive order 13914 titled "Encouraging International Support for the Recovery of and use of Space Resources."²⁴⁴ Within the order, President Trump articulated the US does not consider the Moon Agreement to be an effect or necessary instrument regarding commercial exploration. Additionally, the

²⁴³ UN, A/RES/34/68.

²⁴⁴ Donald J. Trump, Executive Order 13914 of April 6, 2020, Encouraging International Support for the Recovery of and Use of Space Resources, *Federal Register* 85, no. 70 (April 10, 2020): 20381-20382, <https://www.federalregister.gov/documents/2020/04/10/2020-07800/encouraging-international-support-for-the-recovery-and-use-of-space-resource>.

executive order declared the US considered outer space “a legally and physically unique domain of human activity, and the United States does not view it as a global commons.”²⁴⁵ Further, President Trump directed the Secretary of State Department to object to any attempt by any other state or organization to treaty the Moon Treaty as customary law.

Russia immediately criticized the executive order. Kremlin spokesman Dmitry Peskov stated “any kind of attempt to privatize space in one form or another—and I find it difficult to say now whether this can be seen as an attempt to privatize space—would be unacceptable.”²⁴⁶ The Russian Space Agency, Roscomos, released a statement stating the executive order “put the United States at odds with the notion of space belonging to all humanity.”²⁴⁷ While Russia is critical of the US stance, Russia has not made any efforts to sign the Moon Treaty, which, if it did, could strengthen its argument against the U.S.’s position.

China did not raise outright objections to President Trump’s executive order. China’s silence perhaps reflects China’s own plans for Moon exploration. In December 2020, China’s robotic lunar probe Chang’e 5 collected samples on both the surface of the

²⁴⁵ Trump, Executive Order 13914, Section 1.

²⁴⁶ Reuters Staff, “Russian Space Agency says Trump Paving the Way to Seize Other Planets,” *Reuters*, April 7, 2020, <https://www.reuters.com/article/us-usa-russia-space-idCAKBN21P1SY>.

²⁴⁷ *Ibid.*

moon and through drilling into the moon.²⁴⁸ Regardless of objections or intentions for moon exploration, neither Russia nor China have suggested the Moon Treaty as a viable solution to restricting weapons in space. The Moon Treaty is partially suitable because it would prevent weapons on the moon and celestial bodies (but does not exclude the possibility of weapons in space). The Moon Treaty is also feasible because no weapons are currently on the Moon or celestial bodies, and it is already an international treaty, China, Russia, and the United States would only need to become signatories. However, the Moon Treaty is not acceptable to the three major space-faring nations for the reasons cited above, which means it is also not a valid solution to solving the growing divide between space use for peaceful purposes and placing weapons into space.

Despite a lack of consensus on the way forward governing space, current international law not space specific may already provide sufficient governance to protect against the use of weapons in space. While the goal of PAROS was to prevent an arms race in space, and goal of the PPWT was to prevent placing weapons into space, the weapon itself it not necessarily the problem. The use of the weapon is the problem and military personnel using weapons is already governed by LOAC which all major space-faring nations are a party to.

²⁴⁸ Abhijnan Rej, “China’s Moon Plans, A Cautionary Note,” *The Diplomat*, December 4, 2020, <https://thediplomat.com/2020/12/chinas-moon-plans-a-cautionary-note>.

The LOAC is a set of rules of how war is fought. Under LOAC, there are four basic principles: Military Necessity, Humanity, Proportionality, and Distinction.²⁴⁹ A fifth basic principle is often cited as well, known as Chivalry. LOAC itself is a set of generalized rules that apply to armed conflict and have developed from international laws such as the Geneva Conventions and Hague Conventions, as well as state specific rules, such as the Uniform Code of Military Justice for the US, China, Russia, and the United States are members of the Geneva Convention, which addresses the use and treatment of military members during conflict.

The US DoD has made it clear LOAC applies in space for US military operations:

Law of war treaties and the customary law of war are understood to regulate the conduct of hostilities, regardless of where they are conducted, which would include the conduct of hostilities in outer space. In this way, the application of the law of war to activities in outer space is the same as its application to activities in other environments, such as the land, sea, air, or cyber domains.²⁵⁰

Under the United States Space Force doctrine, military space forces must promote responsible behavior in accordance with LOAC, the OST, and other international laws.²⁵¹ Space Force doctrine also has a dedicated heading title “War” and acknowledges the OST peaceful purposes requirement, while pragmatically reminding readers no domain is free from the potential for war, and that LOAC shapes the intensity of warfare.²⁵²

²⁴⁹ 50th Space Wing Legal Office, *Law of Armed Conflict (LOAC)* (Schriever AFB, CO: United States Space Force, March 2020), 3, <https://www.schriever.spaceforce.mil/Portals/17/documents/LOAC-Mar%2020.pdf>.

²⁵⁰ DOD, *Law of War Manual*, 944.

²⁵¹ Headquarters United States Space Force, *Spacepower*, 43.

²⁵² *Ibid.*, 17.

While it appears LOAC may provide some governance in space, the question of when LOAC protections for persons under the Geneva Conventions are triggered is complicated. Common Article 2 states the convention is applicable during all cases of declared war, international armed conflict, and partial or total occupation.²⁵³ If two space-faring nations (not at war) are non-kinetically affecting each other's assets in space, it is unclear if an international armed conflict is initiated under the Geneva Conventions.²⁵⁴ Even defining armed conflict is complicated because the Geneva Conventions did not provide a definition, although the International Criminal Tribunal for the former Yugoslavia proposed a general definition as "an armed conflict exists whenever there is a resort to armed force between States."²⁵⁵ The US DoD dictionary does not provide a definition, only citing "see law of war," which is defined as "that part of international law that regulates the conduct of armed hostilities."²⁵⁶ If a nation temporarily jams a military satellite where it cannot perform its intended function, it would not likely rise to the level of being declared an international armed conflict. However, jamming could still be considered a "hostile act" by the US, which is defined

²⁵³ Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, Geneva, August 12, 1949, accessed April 26, 2021, <https://ihl-databases.icrc.org/ihl/WebART/365-570005?OpenDocument>.

²⁵⁴ Michael Schmitt and Kieran Tinkler, "War in Space: How International Humanitarian Law Might Apply, The Woomeera Manual Project–Part 3," Just Security, March 9, 2020, <https://www.justsecurity.org/68906/war-in-space-how-international-humanitarian-law-might-apply/>.

²⁵⁵ International Committee of the Red Cross, "How is the Term 'Armed Conflict' Defined in International Humanitarian Law," (Opinion Paper, Washington, DC, March 2008).

²⁵⁶ CJCS, *Dictionary of Military and Associated Terms*, 129.

by the DoD as “an attack or other use of force against the United States . . . to preclude or impeded the mission and/or duties of United States forces.”²⁵⁷ The lack of clarity leaves the space community in a legally ambiguous gray area under LOAC.

While jamming may be a gray area, the damage caused could still be reviewed under the proportionality principle of LOAC if it was considered an attack. However, “attack,” as defined in Geneva Conventions Protocol I, means “acts of violence against the adversary, whether in offence or in defence”²⁵⁸ It is unlikely jamming a satellite is considered a violent act, and therefore, might not meet the proportionality test if there is no damage to civilians and their property. If there was a kinetic attack on a satellite, would it be proportional to the damage created not only by the loss of a satellite’s capabilities, but also the thousands of pieces of space debris resulting from a kinetic strike? Inversely, one may argue an ASAT deployment in space is proportional if damage to earth would be greater than the damage caused in space. The US presented a quasi-proportionality argument when it used an ASAT to destroy a failed satellite in 2008. The Bush administration said its goal “was to protect populated areas from the spacecraft’s unused supply of deadly hydrazine propellant,” although many experts believed the test

²⁵⁷ CJCS, *Dictionary of Military and Associated Terms*, 97.

²⁵⁸ Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protections of Victims of International Armed Conflicts (Protocol I), June 8, 1977, accessed May 17, 2021. <https://ihl.databases.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDocument&documentId=17E741D8E459DE2FC12563CD0051DC6C>.

was to demonstrate US ASAT capabilities.²⁵⁹ Since there has not been an armed conflict in space, it is difficult to determine if LOAC can sufficiently govern space as a war fighting domain at this time.

Further, the OST and LOAC are two completely different governing frameworks.²⁶⁰ The OST's theme is peaceful purposes and space is the heritage of mankind, while LOAC is designed expressly for the purpose regulating war. Declaring LOAC applies in space takes a giant leap in acknowledging space is a place where war can be fought without regard to the peaceful purpose requirement of the OST. However, Article III of the OST indirectly incorporates LOAC into space law states party to the OST "shall carry on activities . . . in accordance with *international law* (emphasis added), including the Charter of the United Nations, in the interest of maintain international peace and security and promotion international co-operation and understanding."²⁶¹ While LOAC provides international co-operation and understanding, there is no single treaty titled "Law of Armed Conflict." LOAC is an amalgamation of treaties, customary law, and national law all thrown together under the heading LOAC. The OST governs all space activities, LOAC governs conduct during war.

²⁵⁹ Jim Wolf, "U.S. Shot Raises Tensions and Worries over Satellites," *Reuters*, February 21, 2008, <https://www.reuters.com/article/us-satellite-intercept-vulnerability/u-s-shot-raises-tensions-and-worries-over-satellites-idUSN2144210520080222>.

²⁶⁰ Frans G. von der Dunk, "Armed Conflicts in Outer Space: Which Law Applies?" *International Law Studies* 97 (2021): 188.

²⁶¹ United Nations General Assembly (UN), RES 2222 (21), Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 21st session, December 19, 1966, Article III, https://www.unoosa.org/oosa/oosadoc/data/resolutions/1966/general_assembly_21st_session/res_2222_xxi.html.

In the case of China destroying its own satellite in 2007, LOAC does not cover harm inflicted upon oneself. In addition to an argument an ASAT is against the “peaceful purposes” requirement of the OST, Article VII creates liability for the state whose object damages another states object in space.²⁶² Under this situation, the OST is likely to prevail over any LOAC claim if there was action to hold China accountable. However, China was not held accountable for the ASAT test in 2007. China’s “remarkable incident of irresponsible behavior”²⁶³ led to a mini-arms capability race, where the US demonstrated its ability to shoot down a satellite in low orbit, India conducted an ASAT test in 2019,²⁶⁴ and Russia conducted three ASAT tests in 2020, including a space-based ASAT test in December 2020.²⁶⁵ Since LOAC and the OST have failed to hold nations accountable for destructive actions in space, perhaps the threat of MAD is what is keeping space from becoming a domain where wars are fought.

²⁶² UN, RES 2222 (21), Article VII. The Liability convention expands upon state’s liability. China, Russia, and the United States are members of the Liability Convention. UN, 2777 (26).

²⁶³ Comments made by Mallory Stewart, US Department Deputy Assist Secretary for Emerging Security Challenges and Defense Policy, quoted in Mike Gruss, “U.S. Office: China Turned to Debris-free ASAT Tests Following 2007 Outcry,” *Space News*, January 11, 2016, <https://spacenews.com/u-s-official-china-turned-to-debris-free-asat-tests-following-2007-outcry/>.

²⁶⁴ Brian Weeden and Victoria Samson, “India’s ASAT Test is Wake-up Call for Norms of Behavior in Space,” *Space News*, April 8, 2019, <https://spacenews.com/op-ed-indias-asat-test-is-wake-up-call-for-norms-of-behavior-in-space/>.

²⁶⁵ Hanneke Weitering, “Russia Has Launched an Anti-Satellite Missile Test, U.S. Space Command Says,” *Space*, December 16, 2020, <https://www.space.com/russia-launches-anti-satellite-missile-test-2020>.

The Kessler Syndrome, a theory named after NASA scientist Donald Kessler, describes a self-sustaining, cascading collision of space debris in the low earth orbit.²⁶⁶ Basically, a piece of debris will eventually collide at a high speed, up to 18,000 miles per hour, with an object such as a satellite, which will then create additional orbital fragments that can then collide with additional objects in orbit.²⁶⁷ Debris typically occurs unintentionally, often caused by left over fuel and batteries onboard spacecraft and rockets.²⁶⁸ Space debris is also created by smaller objects, such as spacecraft parts and paint chips. According to the European Space Agency, as of April 15, 2021, there are 34,000 debris objects greater than 10 cm, 900,000 objects between 1 cm to 10 cm, and 128 million objects great than 1 mm to 1 cm.²⁶⁹

The phrase, MAD is often synonymous with the Kessler Syndrome, based on the nuclear weapons theory that neither country with a nuclear weapon would use against the other because it would lead to the destruction of both nations.²⁷⁰ Space debris does not discriminate, and while the United States has the most to lose from space debris, every

²⁶⁶ Louis de Gouyon Matignon, “The Kessler Syndrome,” Space Legal Issues, March 27, 2019, <https://www.spacelegalissues.com/space-law-the-kessler-syndrome>.

²⁶⁷ Ibid.

²⁶⁸ European Space Agency, “The Current State of Space Debris,” December 10, 2020, https://www.esa.int/Safety_Security/Space_Debris/The_current_state_of_space_debris.

²⁶⁹ European Space Agency, “Space Debris by the Numbers,” April 15, 2021, https://www.esa.int/Safety_Security/Space_Debris/Space_debris_by_the_numbers.

²⁷⁰ Editors, Encyclopedia Britannica, “Mutual Assured Destruction,” *Encyclopedia Britannica*, accessed April 27, 2021, <https://www.britannica.com/topic/mutual-assured-destruction>.

nation with space capabilities has to potential to suffer significant losses due to space debris. This threat should provide the military, civilian, and commercial incentives to refrain from intentionally creating additional debris. However, relying on a theory is not sound legal practice. Even the MAD theory was backed by nuclear treaties, confidence building measures and verification methods to ensure compliance. Without written regulations, MAD is simply a theory that cannot be substituted for governance.

Summary

Chapter 4 revealed the proposed treaties of PAROS, and PPWT, and the proposed Codes of Conduct are not valid under the Lykee model at this time. Chapter 4 also revealed the current spaces treaties are insufficient to govern space as a war fighting domain since the space treaties were built on the notion space is for peaceful purposes. If specific space treaties are not sufficient to govern warfighting in space, then other sources of law must be considered. LOAC can provide some governance in the event of armed conflict in space, but the need to evoke LOAC principles has not been required to date. Further, simply declaring space is governed in LOAC is complicated, because there is no “LOAC” treaty. LOAC is comprised of international treaties, domestic laws, and regulations governing military conduct in specific conflicts. At this time, LOAC application in space is speculative, and cannot be relied upon to solve the gaps in space law. Perhaps the strongest enforcement mechanism at this time is the Kessler syndrome, which is not a treaty or code of conduct, it is merely the law of physics that regulate physical warfighting in space. While the MAD theory may be comforting absent written regulations, it is not a sound legal strategy that can be relied upon to govern space as a warfighting domain.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This research began with identifying the problem, which is the OST is insufficient to govern space as a warfighting domain. Through a review of the OST and other space treaties, it became evident warfighting in space could not be governed by those treaties alone. Once the problem was identified, the first question, “are the space treaty proposals and recommended codes of conduct a valid solution to govern space as a warfighting domain?” was posed. The answer to this question is no, not at this time because each fail under the Lykee validity test since the three largest space-faring nations are opposed to some, if not all of the proposed solutions. This left the final question, are the current space treaties combined with the LOAC strong enough to govern space as a warfighting domain. Here the answer is muddled because to date, they have worked well enough, but it is clear they will not be sufficient much longer as space becomes more competitive.

To fix a problem, solutions must be identified and tested. Several solutions were tested under the Lykke model and each fell short of providing a valid solution to the problem. These solutions include the proposed treaties of PAROS and PPWT, and the proposed codes of conduct from the EU and the UK. PAROS and PPWT fell short because the United States will not specially consider any treaty that does not include ASATs, and is generally opposed to any treaty that restricts the use of space. The EU Code of Conduct has not been advocated by China, Russia, or the US. China and Russia are not interested in codes, instead they are focused on the PPWT. The UK Code of Conduct has been mildly accepted by the US because it addresses ASATs, but similar to the EU Code, China and Russia do not support the UK Code. The Moon Treaty is already

in effect, however, China, Russia, the United States and most other nations have not signed based on similar objections for the other proposals. Further, the Moon Treaty only limits weapons on the Moon and other celestial bodies and would only partially solve the current gap in space law.

Without a valid treaty or code of conduct presenting a viable option to the three largest space-faring nations, one must look to sources of governance that are not space specific. LOAC appears to be the most obvious choice, however, LOAC only applies once war begins. Declaring LOAC will fill the gaps in space law accelerates the possibility war will occur in space. Space activities are still in a gray area of warfare, where the peaceful purposes requirement is skirted by using space assets in war, but kinetic, state versus state, military action in space has not occurred.

One could argue the OST sufficiently addresses space as a warfighting domain without a need to additional treaties. The argument is simple: War in space cannot take place because it obviously violates the peaceful purposes requirement of the OST. Just because the space-faring nations have liberally interpreted peaceful purposes to mean no aggressive acts in space, does not mean the interpretation is correct. Even with a liberal interpretation, and several loopholes, there is sufficient evidence the OST is working. War in space has not taken place, even though the capability to conduct kinetic attacks in space has been around for several decades. The OST, signed by every space-faring nation, has kept space peaceful for 53 years. What other treaty has a perfect track record of never being broken? Even though each space-faring nation would like to patch specific loopholes, the OST is working exactly the way was designed to.

While the argument above is narrowly tailored to one, technically correct fact, it is not a reasonable argument to rely on. The reasons proposed treaties and codes exist is because there is no trust between the space-faring nations due to the generous interpretations of the loopholes that have already been exploited. It is better to get ahead of a problem than to play catch up after the treaty has been broken. It appears every space-faring nation is anticipating a breach of the treaty; it is just a matter of time before it occurs. While nothing has happened to date, the use of space is still relatively new, and extremely expensive. As more nations achieve space capabilities, orbital real estate will become scarce, and a fight for resources is likely to ensue.

One can also argue MAD provides a stronger enforcement mechanism than any written document can provide. The sheer economics of placing objects into orbit should deter aggressive acts that will harm one's own costly systems. In addition to cost, the loss of one's own satellite outweighs any benefit of attacking an adversary's system. The MAD theory has worked for nuclear, why so should it not work for space? MAD is very appealing in absence of a written treaty or code, but MAD only works for kinetic strikes. Even with the MAD theory applied to nuclear weapons, plenty of treaties still had to be written concerning the use of nuclear weapons, and treaty compliance and verification efforts had to be mandated to ensure the parties were meeting their obligations.

One the other hand, perhaps MAD in space is over estimated. With hundreds of thousands of pieces of space debris currently in orbit, how many have harmed space operations? If space debris was such a serious problem, why are commercial companies still spending millions of dollars to put their assets unprotected into space? If the

environment was so bad, why have minimal efforts been made to develop technology which can clean up space debris?

The consequences of nuclear war are very visible and tangible, while the consequences of MAD in space has not been witnessed by society at large. Unfortunately, an event that grabs the attention of all people may be required to address warfare in space. To date, space legal concerns are limited to a very small group of people who work directly with space and a few academics who study space law. The world at large has not witnessed a catastrophic space event. A catastrophic event tends to become the catalyst for meaningful regulation in war, whether it is the use of nuclear weapons, chemical weapons, or the treatment of prisoners of war. Even the most detrimental, physical action in space in modern time, the Chinese ASAT test in 2007, went relatively unnoticed by the general population. Space debris is not visible, and there was no tangible effect on the masses. Internet, global positioning satellites, cell phones, and other communication devices still worked just fine, companies continued to launch expensive satellites, no one died, and there was no military mobilization of forces to respond to China's action. Without a significant catalyst, meaningful change to space law is unlikely to occur.

Recommendation

The United States currently has the opportunity to shape the future governing the use of space. In the past, the US led the charge in developing the OST, but has now taken a back seat to developing additional space governance. Instead of being a leader in developing international agreements, the US has consistently argued against all of the proposals, without submitting a framework of its own. Presidential administrations have

ranged from open but non-committal to borderline hostile to any proposed space regulation. While any future space treaty would likely restrict US military capabilities in space, the treaty would also protect US assets. If the US stalls any longer, all other space-faring nations may move to proceed without the US. Over time, the rest of the space-faring nations will have an enforceable treaty, while the US will not be able to present a credible argument to enforce consequences against a state which violated the treaty. A treaty without the US, could develop into customary international law. This will lead to a situation where the US can rightfully argue it is not part of the treaty and therefore, does not need to comply, however, international consensus over a treaty violation is persuasive justification for action taken against the US

The US DoD has called for guidelines in space, but has not proposed any specifics. For example, on May 5, 2021, during a House Armed Services Committee hearing on Rules-Based Order in Space, testimony, John D. Hill, performing duties as the assistant secretary of defense for space policy, said “there are many benefits to having common guidelines for space operations.”²⁷¹ Hill touted DoD operations as the model for responsible space behavior, and are consistent with international law, include LOAC and the right of self-defense under Article 51 of the UN Charter.²⁷² Hill acknowledged further development of internationally agree-upon rules will benefit the DoD and commercial operations. While Hill was suggesting non-binding guidelines, his advocacy for US leadership in the development of a “rules-based order for space activities” is a

²⁷¹ Lopez, “There Must Be Rules for How We Use Space.”

²⁷² Ibid.

small, positive step towards working towards an international solution.²⁷³ During the hearing, Bruce Turner from the US State Department, did not appear optimistic about a binding treaty in the near future. “I think we’re trying to make the best out of what is possible at this given moment in time . . . that does not exclude the possibility of legally binding treaties down the road, but that’s not where we are, given the kinds of competition posed by Russia and China.”²⁷⁴

An all-encompassing treaty which addresses China and Russia’s concerns about weapons in space and the US concerns about ASATs is unlikely at this time. However, the US could introduce an amendment to the OST, or draft a new proposal addressing the use of ASATs. While limited, it would be a good faith measure to demonstrate the US is serious about space regulation. The US has legitimate concerns China and Russia may not comply with the weapons restrictions in PAROS and PPWT, but instead of outright dismissing the proposals, the US should craft additional provisions to the proposals, such as methods to verify treaty compliance. The US and Russia recently announced an extension to the Strategic Arms Reduction Treaty (START) for five more years. This treaty allows the US and Russia to inspect each other’s ICBMs, Submarine-launched ballistic missiles, and heavy bombers until February 5, 2026.²⁷⁵ If treaties and trust

²⁷³ Lopez, “There Must Be Rules for How We Use Space.”

²⁷⁴ Patrick Tucker, “Nobody Wants Rules in Space,” *Defense One*, May 6, 2021, <https://www.defenseone.com/technology/2021/05/nobody-wants-rules-space/173870>.

²⁷⁵ Jim Garamone, “U.S., Russia Extend Arms Reduction Treaty,” *Defense News*, February 4, 2021, <https://www.defense.gov/Explore/News/Article/Article/2493593/us-russia-extend-arms-reduction-treaty/#:~:text=The%20United%20States%20and%20the,five%20years%2C%20U.S.%20officials%20announced.&text=%22Extending%20the%20New%20START%20Treaty,Secretary%20of%20State%20Antony%20j>

building and confidence measures work for the deadliest weapon on earth, space-faring nations should be able to find common ground for governing space as a warfighting domain.

Further Research

Space as a warfighting domain has recently been accelerated with the elevation of US Space Command to a geographic combatant command and the establishment of an additional branch of the US military dedicated to space. While the peaceful purposes requirement of the OST has been interpreted favorable by nations developing military applications that use space, and nations have exploited loopholes within the OST, there has been no violation of the OST resulting in armed conflict. Prior to developing treaties governing space as a war fight domain, the types and capabilities of weapons should be known. Unfortunately, in order for the weapons to be known, they will likely have to be used, unless a state is willing to reveal highly classified capabilities without any opportunity to use the weapon prior to regulation. Further research, even without a demonstration, could theorize about what weapons could be used, and seek to pre-emptily regulate use.

As mentioned in the previous chapter, regulations and treaties tend to come after a nation has demonstrated a capability that grabs the attention of the entire world. While WMDs are restricted in space through the OST, ASATs, lasers, and conventional weapons are not specifically restricted. Even a strongly condemned ASAT test in 2007 has failed to unite space-faring nations in drafting regulation reducing or restricting the use of ASATs. Therefore, further research should focus on what weapons are possible in space and how to regulate them. Additional research could address what capabilities the

Space Command needs to gain and maintain an advantage in space to defend the United States, while ensuring it complies with international laws. If these answers were known, drafting policy, regulations, and treaties would be less complicated, although technological capabilities exponentially grow in comparison to the length of time it takes to ratify a treaty.

Chapter Summary and Conclusion

The OST was considered the “Magna Carta of Space”²⁷⁶ when it went into effect in 1967 with 110 nations to eventually ratify the treaty. However, deficiencies in the treaty were recognized, which resulted in four additional treaties seeking to clarify or provide additional regulations. By the last of the four additional treaties (moon), only 18 nations became signatories, and it did not include the largest space-faring nations of China, Russia, or the United States. Since then, additional treaty proposals such as PAROS, the PPWT, and codes of conduct from the EU and the UK have been recommended, but none have been accepted by all the major space-faring nations. At the same time, there is a growing fear and distrust among the space-faring nations suggesting it is only a matter of time until weapons, and possibly war, commence in space.

The US has publicly declared space a warfighting domain. This leaves the world in a situation where the current treaties are insufficient to govern space as a warfighting domain, and there is no valid proposal to address these deficiencies. Without new treaties, war like activities in space will likely be regulated by the LOAC, which is not equipped

²⁷⁶ Deanna Paul, “Space: The Final Legal Frontier,” *The Washington Post*, August 31, 2019, <https://www.washingtonpost.com/technology/2019/08/31/space-final-legal-frontier/>.

to address the unique challenges in space. Unfortunately, any new regulations will likely come after a catastrophic event, or a series of events which capture the attention and anger of the general population. When it happens, it will be clear to the international community space is no longer being used for peaceful purposes, and the heritage of mankind will suffer the consequences.

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