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Towards a Framework on the Weaponization of Space: One Small Step or Giant Leap?

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Solo Flight

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**TOWARDS A FRAMEWORK ON THE WEAPONIZATION OF SPACE:
ONE SMALL STEP OR GIANT LEAP?**

By Major J.P. Bishoff

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TOWARDS A FRAMEWORK ON THE WEAPONIZATION OF SPACE: ONE SMALL STEP OR GIANT LEAP?

Introduction

During early 2020, while most of the world was becoming fixated on the unprecedented global pandemic, an unusual situation was unfolding in a decidedly COVID-free environment far above our planet. Two Russian satellites, COSMOS 2542 and COSMOS 2543 “conducted maneuvers near a U.S. Government satellite that would be interpreted as irresponsible and potentially threatening in any other domain.”¹ The activity was flagged by the U.S. in February.² A few months later, in July, evidence suggested that Cosmos 2543 had, in fact, “conducted a non-destructive test of a space-based anti-satellite weapon” by deploying “a new object into orbit.”³ This testing of “in-orbit anti-satellite weaponry” was commented on by the U.S. Assistant Secretary of State noting that “Moscow aims to restrict the capabilities of the United States while clearly having no intention of halting its own counterspace program.”⁴ Despite such statements from the U.S. State department and U.S. Space Command, which were amplified on official U.S. government social media accounts, no mention or reference was made to an applicable treaty, law or even international agreement.⁵ Indeed, this, and similar episodes,

¹ U.S. Space Command Public Affairs Office, “Russia Tests Direct-ascent Anti-satellite Missile”, U.S. Space Command News, 15 April 2020, accessed 10 April 2021, <https://www.spacecom.mil/News/Article-Display/Article/2151611/russia-tests-direct-ascent-anti-satellite-missile/>.

² *Ibid.*

³ U.S. Space Command Public Affairs Office, “Russia Conducts Space-based Anti-satellite Weapons Test”, U.S. Space Command News, 23 July 2020, accessed 10 April 2021, <https://www.spacecom.mil/MEDIA/NEWS-ARTICLES/Article/2285098/russia-conducts-space-based-anti-satellite-weapons-test/>.

⁴ *Ibid.*

⁵ U.S. Space Command, Twitter post, 23 July 2020, 11:40 a.m., accessed 4 April 2021, https://twitter.com/US_SpaceCom.

highlight the lack of a common, accepted international framework regarding the weaponization of space and Anti-Satellite (ASAT) weapons.

This paper will discuss the growing urgent need for such a framework. Space has become an increasingly important domain to states and the number of spacefaring nations continues to increase. Concurrently, security in space has become more tenuous due to an increasingly varied arsenal of threats. These factors suggest that now is the time to pursue an international framework to structure how states can and should interact on the topic of ASATs. This essay will discuss the current situation and provide a recommended path towards a framework governing ASAT activities.

The Importance of the Space Domain

Since the beginning of the space age during the Cold War, space-based capabilities have been seen to have the potential to “enhance the quality of life for... people around the world.”⁶ Space-based assets have come to enable many functions critical to daily civilian life on earth. Satellites “connect and inform” society as they have become central to basic functions like communication, information sharing and navigation.⁷ Earth observation from space is an effective and necessary means to perform important tasks such as “environmental monitoring, disaster response, and search and rescue.”⁸

⁶ Executive Office of the President of the United States, *National Space Policy of the United States of America* (Washington: 2020), 1.

⁷ Department of Innovation, Science and Economic Development Canada, *Exploration Imagination Innovation: A New Space Strategy for Canada* (Ottawa: ISED, 2019), 5.

⁸ *Ibid.*

From a defense and security point of view, space has become the “ultimate high ground.”⁹ Satellite communications, navigation and surveillance systems are essential pre-requisites to successful military operations.¹⁰ These space-based capabilities are fundamental in enabling terrestrial commanders to effectively employ the military functions of command, sense, act, shield, sustain and generate on earth.¹¹ They also directly enable specific critical functions such as environmental monitoring of the battle space, missile warning and nuclear detonation detection.¹²

Space-based assets allow for unencumbered and unrestricted global overflight as “international law does not extend a nation’s territorial boundaries into space” as compared to air-based or terrestrial-based assets.¹³ They also have the ability to maintain a global perspective with orbits allowing for fast revisit rates, high collection capacities and wide fields of view.¹⁴ That is to say, satellites in the space domain have unmatched speed, reach and persistence compared to terrestrial or airborne capabilities.¹⁵ These characteristics facilitate the ability to support high numbers of missions and users at a given time.¹⁶

⁹ Royal Canadian Air Force, *Concept of Operations for The CAF Joint Space Program*, (Ottawa: DND Canada, 2020), 5.

¹⁰ *Ibid.*

¹¹ Royal Canadian Air Force, B-GA-400-000/FP-001, *Royal Canadian Air Force Doctrine* (Ottawa: DND Canada, 2016), 19.

¹² Joint Chiefs of Staff, *Space Operations*, JP 3-14 (Washington, D.C.: Joint Chiefs of Staff, 2018), II-6&7.

¹³ *Ibid.*, I-5.

¹⁴ *Ibid.*

¹⁵ *Ibid.*

¹⁶ *Ibid.*

In summary, space-based capabilities have become a necessity. Both in day-to-day life and in the defense and security domain, satellites in space have unique characteristics that enable crucial functions on earth.

A Congested, Contested & Competitive Domain

Increasingly states, as well as non-state actors, have recognized the importance of obtaining space-based capabilities which has led the space domain to become ever more “congested, contested and competitive.”¹⁷ The early days of the space age, where only a few nations held a small number of space-based assets during the Cold War, are long gone.¹⁸ Today, more than sixty states and “government consortia” hold such assets.¹⁹ These governments, along with commercial and academic entities, operate thousands of active satellites.²⁰ Congestion is exasperated by man-made space debris from materials left over from launches, as well as disabled or destroyed pieces of satellites that are not under positive control and are a threat to space-based assets.²¹ Space has always been an unforgiving and “naturally hazardous environment”, however the realities of the current congested nature of the domain have made it more so.²²

In addition to the challenges of the naturally harsh and congested environment in which they reside, increasingly, space-based assets need to contend with active threats as well.²³ The domain has become increasingly contested and competitive resulting in states

¹⁷ Department of Defense and Office of the Director of National Intelligence, *National Security Space Strategy Unclassified Summary*, (Washington, DC, January 2011), 1.

¹⁸ *Ibid*, 2.

¹⁹ *Ibid*.

²⁰ *Ibid*.

²¹ *Ibid*.

²² Joint Chiefs of Staff, *Space Operations*, I-6.

²³ DoD & ODNI, *National Security Space Strategy Unclassified Summary*, 3.

and non-state actors considering means to potentially “deny, degrade, deceive, disrupt, or destroy” assets of competitors and adversaries.²⁴

In summary, the importance of the space domain has resulted in it becoming ever more congested, contested and competitive. States and other actors must contend with the challenges of the natural environment as well as passive and active man-made threats to space-based assets.

Threats to Satellites

Satellites have become a ubiquitous part of security and defense for space-faring nations.²⁵ Military applications have driven a large number of space missions and activities since the beginning of the space age.²⁶ Indeed, “military activities”, such as surveillance, communications and navigation, that are in support of terrestrial military operations have been ongoing for so long and are such common practice by states that the “overwhelming majority of experts” deem this type of militarization of space acceptable and in accordance with applicable norms, rules and laws.²⁷ However, as space becomes more contested and competitive states are confronted with the prospect of weaponization. Weaponization refers to the “deployment of weapons of offensive nature in space or on the ground with their intended target located in space.”²⁸ In this context weaponization aligns with the concept of counterspace activities, of which there are several types.²⁹ Kinetic threats posed by ASAT missiles have been developed and demonstrated by a

²⁴ *Ibid.*

²⁵ Fabio Tronchetti, “Legal Aspects of the Military Uses of Outer Space.” In *Handbook of Space Law*. Research Handbooks in International Law. Cheltenham, UK: Edward Elgar Publishing, 2015, 331.

²⁶ *Ibid.*

²⁷ *Ibid.*, 333.

²⁸ *Ibid.*

²⁹ Defense Intelligence Agency, *Challenges to Security in Space*, (Washington D.C.: DIA, 2019), 9.

small group of nations, notably the U.S., Russia, China and most recently India in 2019.³⁰ Directed Energy Weapons seek to damage or destroy satellites by employing high-powered lasers or microwaves.³¹ Russia, China and others are currently seeking to develop this type of capability.³² Cyber threats are also of concern and are relatively prevalent in general, as multiple documented terrestrial attacks on NATO partners in recent years have demonstrated.³³ As with terrestrial information-technology connected capabilities, a cyber-attack can render a space-based system permanently damaged or disabled.³⁴ Rendezvous and proximity operations, where two or more satellites come together at close distances, can be used to deploy anti-space weapons.³⁵ Once in close proximity, co-orbital ASATs can detonate, collide, deploy DEWs or interfere with the communications of the target satellite.³⁶ As alluded to previously, Russia has drawn criticism for this type of activity in low-earth orbit, and they have also conducted unwelcome proximity maneuvers in geostationary orbit.³⁷ China is also developing dual use technology where co-orbital vehicles are being designed nominally for inspection and repair purposes which could also be used as a weapon.³⁸

Nations such as the U.S., China, Russia, India and others have demonstrated the ability to employ various modes of ASAT systems. This implies that ASAT systems

³⁰ Lt. General P.C. Katoch (Retd), "Beyond the ASAT Capability," *SP's MAI* (Nov 20, 2020), 1.

³¹ DIA, 9.

³² *Ibid.*, 20, 29.

³³ James Joyner, "Competing Transatlantic Visions of Cybersecurity." In *Cyberspace and National Security: Threats, Opportunities, and Power in a Virtual World*, edited by Derek S. Reveron. Washington: Georgetown University Press, 2012, 163.

³⁴ DIA, 9.

³⁵ Kaitlyn Johnson, *Key Governance Issues in Space*. Report. Center for Strategic and International Studies (CSIS), 2020, 18.

³⁶ *Ibid.*

³⁷ *Ibid.*, 19.

³⁸ DIA, 21.

could be theoretically used, and, indeed relevant national doctrine does not exclude this as a course of action. Chinese doctrine, for example, notes that the destruction of an enemy's satellites during a conflict would hamper the targeted adversary's abilities to leverage precision guided missiles and impair their "reconnaissance, communications, navigation, and early warning" capabilities.³⁹ Similarly, Russian doctrine notes that current U.S. military dominance is underpinned, in part, by their space-enabled capabilities.⁴⁰ Counterspace weaponry, therefore, is seen as a potential avenue to level the playing field in the event of conflict.⁴¹ The U.S. does not have a recognized co-orbital nor direct-ascent kinetic ASAT program but has conducted testing demonstrating these capabilities.⁴² U.S. space policy has stated that efforts to interfere with national and allied space systems shall be deterred, defended against and if necessary defeated.⁴³ Within the last decade, there has been an acknowledgement of space as a warfighting domain and "the inevitability of conflict on earth extending to space."⁴⁴

In summary, motivated by the increasingly contested and competitive nature of the domain, several nations have acquired the requisite technology and policy/doctrinal framework to allow for "a path toward the overt weaponization of space."⁴⁵ Some observers suggest that "weaponization is unstoppable" and the task at hand, therefore, is to develop and augment a framework that can manage the risks that it presents.⁴⁶

³⁹ *Ibid.*, 14.

⁴⁰ *Ibid.*, 24.

⁴¹ *Ibid.*

⁴² Brian Weeden and Victoria Samson, eds., "Global Counterspace Capabilities: An Open Source Assessment," Secure World Foundation, April 2020, 3-2 - 3-11.

⁴³ *Ibid.*, 3-19.

⁴⁴ *Ibid.*

⁴⁵ Joan Johnson-Freese and David Burbach "The Outer Space Treaty and the Weaponization of Space." *Bulletin of the Atomic Scientists* 75, no. 4 (2019), 137.

⁴⁶ *Ibid.*, 138.

Theoretical Implications of Weaponization on International Relations

The possibility of overt weaponization has allowed for the consideration of the impacts through the lens of international relations theories. A realist approach would suggest that states would be well served to pursue weaponization in order to gain control over the space domain as the ultimate “geo-strategically vital asset”.⁴⁷ This model suggests that if a state were to achieve such control over space, “it would hold potential mastery over the entire Earth.”⁴⁸ Liberal theorists have made similar suggestions regarding the outcomes of weaponization and control of space.⁴⁹ However, rather than frame this as a “strategic opportunity,” the outcome of a “space-based hegemony” is seen as a potential “problem to be kept in check through collaboration.”⁵⁰ Similarly, from a critical geopolitical perspective, it has been theorized that the weaponization of space could eventually lead to a space-based empire with the ability to project force anywhere, “in effect gain[ing] a monopoly on the means of violence over all of the earth.”⁵¹ Any such theoretical monopoly, hegemony, or space-based empire, resulting initially from weaponization and then domination of the space-domain, would take the world into potentially uncharted geo-political waters.⁵² Even a benevolent ruling entity would be susceptible to the corrupting nature of the absolute power that would result from conquering the space domain.⁵³

⁴⁷ Jonathan Havercraft and Raymond Duval, “Critical Astropolitics: The Geopolitics of Space Control and the Transformation of State Sovereignty,” In *Securing Outer Space : International Relations Theory and the Politics of Space*, edited by Natalie Bormann and Michael Sheehan. Routledge Critical Security Studies Series. Abingdon: Routledge, 2009. Chapter 3, 45.

⁴⁸ *Ibid.*, 47.

⁴⁹ *Ibid.*

⁵⁰ *Ibid.*, 48.

⁵¹ *Ibid.*, 53.

⁵² *Ibid.*, 57.

⁵³ *Ibid.*

Extant Agreements

The theoretical implications following overt weaponization, as well as the immense importance of space-based assets to modern life indicate that this is an important issue for nations and the international community. Perhaps it is counterintuitive, then, to note that a “coherent and comprehensive legal framework governing... [such] activities in outer space is currently missing.”⁵⁴

The “Magna Carta of space”, the 1967 Outer Space Treaty (OST) underpins the extant framework.⁵⁵ Developed by the U.S.S.R. and U.S.A. near the beginning of the space age and at the height of the Cold War, the OST articulates several key foundational principles regarding the behaviour of nations in space in general.⁵⁶ It mandates that all states are free to use and explore space, and that the use of space and space exploration shall be pursued in the interest and for the benefit of all nations.⁵⁷ Also, states are not able to appropriate or claim sovereignty over outer space and must conduct themselves in accordance with international law while exploring or using space.⁵⁸ However, a “common misperception is that the Outer Space Treaty bans the weaponization of space.”⁵⁹ In fact, Article IV of the OST only prescribes some restrictions related to weaponization.⁶⁰ It does outlaw the placement of nuclear and other weapons of mass destruction in space.⁶¹ It bans all instalments of weapons on celestial bodies such as the

⁵⁴ Tronchetti, 332.

⁵⁵ Joan Johnson-Freese and David Burbach, 137.

⁵⁶ David A. Koplow, "ASAT-Isfaction: Customary International Law and the Regulation of Anti-Satellite Weapons." *Michigan Journal of International Law* 30, no. 4 (2009), 1197.

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

⁵⁹ Joan Johnson-Freese and David Burbach, 137.

⁶⁰ Tronchetti, 332.

⁶¹ *Ibid.*, 335.

moon.⁶² It calls for the peaceful use of space, which has come to be interpreted in practice to mean remaining in compliance with Article 2(4) of the UN Charter, the prohibition of the use or threat of force.⁶³ Article IX of the OST also indirectly limits weaponization as it requires that states consult with other space-faring nations prior to any activities that could “cause harmful interference.”⁶⁴ In summary, the OST does set some limitations, however does not preclude the use of ASAT weapons “[a]s long as such weapons are not nuclear weapons or weapons of mass destruction” and even those restrictions only refer to weapons in orbit, not ground-based ASATs.⁶⁵ The Limited Test Ban Treaty from 1963, however, restricts nuclear explosions in space in general, precluding the use of terrestrially launched nuclear ASAT weapons.⁶⁶ Also known as the 1963 Partial Test Ban Treaty, the Limited Test Ban Treaty was enhanced by the 1996 Comprehensive Nuclear Test Ban Treaty which aims to strengthen ways to verify and ensure compliance.⁶⁷ Apart from these restrictions regarding nuclear weapons there are agreements in place which focus on the curtailment of proliferation of ballistic missile technology. For example, the International Code of Conduct against Ballistic Missile Proliferation (ICOC) sets out to discourage the proliferation of ballistic missiles to nations suspected of pursuing nuclear, biological or chemical weapons programs.⁶⁸ As ballistic missile technology is directly related to space launches and direct ascent kinetic ASAT weapons, the ICOC has the effect of slowing further proliferation of this type of technology to bad actors in the

⁶² Joan Johnson-Freese and David Burbach, 137.

⁶³ Tronchetti, 339.

⁶⁴ *Ibid.*, 341.

⁶⁵ *Ibid.*, 338.

⁶⁶ David A. Koplow, 1199.

⁶⁷ Tronchetti, 345.

⁶⁸ *Ibid.*, 346.

international community.⁶⁹ It also encourages transparency and calls for signatories to provide an overview and notifications of “ballistic missile and space launch” activities.⁷⁰ The ICOC is non-binding and does not ASAT-related ballistic missile activity per se, it merely discourages further proliferation of related technology and encourages transparency of nations who already possess it.⁷¹

In summary, the extant treaty framework is largely only prescriptive and binding on matters related to nuclear and weapons of mass destruction in space. Considering the wide variety of ASATs, none of which rely on nuclear weapons, the governing of their development, testing and utilization is largely unrestrained by binding treaties. Given the importance of space-based assets additional measures regarding the testing and use of ASATs would be beneficial.

Past Attempts at Enhancing Framework

The space community and “[a]rms controllers have hardly been ignorant or indifferent about the danger of ASAT weapons” and the lack of prescriptive or binding agreements.⁷² Efforts have been made on progress toward improving the situation. The first attempts were made in a series of bilateral treaty discussions and negotiations between the U.S. and U.S.S.R. in 1978-1979.⁷³ The negotiations were unsuccessful in reconciling differing views on the definition of what comprised an ASAT, modes and

⁶⁹ *Ibid.*

⁷⁰ *Ibid.*

⁷¹ *Ibid.*, 347.

⁷² David A. Koplow, 1215.

⁷³ *Ibid.*, 1216.

methods of compliance verification and differing views on which nations would be signatories beyond the U.S. and Soviet Union.⁷⁴

In more recent years, “Russia and China have launched coordinated diplomatic efforts to mitigate what they view as negative aspects of U.S. space policy” under Prevention of the Arms Race in Outer Space (PAROS) centred initiatives within the U.N.’s Conference on Disarmament (CD).⁷⁵ In 2002 they led efforts on a proposed outline on a “Treaty on the Prevention of the Deployment of Weapon in Outer Space, [and] the Threat or Use of Force Against Outer Space” to the CD.⁷⁶ Other proposals related to PAROS were submitted in 2004 & 2006 and then in 2008 Russia and China proposed a draft of a “Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects” or PPWT.⁷⁷ These efforts were not embraced by the U.S. and like-minded space-faring nations due to the inability to agree on the definition of a space weapon and the inability to monitor and verify activities covered in the draft PPWT.⁷⁸

Proposed Way Forward

Due to the current “largely permissive international legal framework” three lines of effort are proposed to improve the situation.⁷⁹ The first line of effort involves a continuation of attempts at developing momentum on binding agreements. A renewed

⁷⁴ *Ibid.*

⁷⁵ Nikita Perfilyev, "The Sino-Russian Space Entente." *Astropolitics* 8, no. 1 (2010), 28.

⁷⁶ *Ibid.*

⁷⁷ *Ibid.*, 29.

⁷⁸ Daniel Porras, “Anti-Satellite Warfare and the Case for an Alternative Draft Treaty for Space Security,” *Bulletin of the Atomic Scientists* 75, no. 4 (2019), 145.

⁷⁹ Victoria Samson and Brian Weeden, “Enhancing Space Security: Time for Legally Binding Measures,” *Arms Control Today*, December 2020.

effort led by the West to establish additional treaties that govern ASATs and the weaponization of space is starting to take shape. The U.K. has proposed a new resolution, U.N. Resolution 75/36, which seeks to “broker an international consensus on responsible behaviour in space.”⁸⁰ Also, the U.S., which has generally not demonstrated “willingness to discuss legally binding measures,” has signalled a shift from this position.⁸¹ Recently this year, senior leadership from U.S. Space Command noted that “international momentum is building for the adoption of a binding set of rules to make space safer and sustainable” and that U.S. officials are supportive of U.N. Resolution 75/36.⁸² With this recent change in the US’s calculus on binding resolutions, the U.K.’s proposed resolution designed to alleviate gridlock on the issue, and key allies like Canada, Australia, New Zealand, Germany and France supporting both developments it would appear that the West is poised to provide leadership in this domain.⁸³ If Russia and China are to remain generally amenable to binding rules, as they appeared to be in past PAROS and PPWT efforts, indeed there could be the potential to make headway on this front.

The second line of effort proposed involves leveraging binding mechanisms outside of explicit treaties. Customary International Law (CIL) could potentially be applied to the weaponization of space and ASAT activity. CIL, though not explicit per se, can be binding under certain circumstances and is recognized by such institutions as the International Court of Justice and in the U.S. Federal Court system.⁸⁴ CIL norms are

⁸⁰ UK Foreign Office, “UK Push for Landmark UN Resolution to Agree Responsible Behaviour in Space,” August 26, 2020, <https://www.gov.uk/government/news/uk-push-for-landmark-un-resolution-to-agree-responsible-behaviour-in-space>.

⁸¹ Samson & Weeden, 2020.

⁸² Sandra Erwin, “U.S. to Support International Effort to Set Rules of Behavior in Space,” *Spacenews*, 24 February 2021.

⁸³ *Ibid.*

⁸⁴ Koplav, 1222.

established when states follow and practice “widespread, longstanding” behaviours, thereby satisfying the *objective* component of CIL.⁸⁵ The following of such norms must also be done out of a sense of legal obligation, thereby satisfying the *subjective* component of CIL.⁸⁶ Although ASAT technologies are prevalent they have never, in fact, been used during “hostilities or in a time of crisis against the spacecraft of another country.”⁸⁷ In addition, there have only been a handful of operational tests since 1985.⁸⁸ This lack of operational use and limited live testing suggests there is a general widespread and longstanding aversion to the employment of ASATs, satisfying the “objective criterion” of CIL.⁸⁹ The subjective component of ASAT CIL could be established by strongly reacting to any ASAT testing activity carried out.⁹⁰ Protests, such as those carried out in response to the COSMOS 2542/2543 situation, need to be characterized as “unjustified, unacceptable, and therefore illegal” as opposed to simply irresponsible or “unwelcome.”⁹¹

The third line of effort proposed would be the pursuit of legally non-binding agreements. “[P]olitically binding ‘rules of the road,’ unwritten ‘gentlemen’s agreements,’” and the like could augment efforts towards legally binding treaties and the establishment of relevant binding CIL norms.⁹² Such an approach could take the form of

⁸⁵ *Ibid.*, 1223.

⁸⁶ *Ibid.*

⁸⁷ *Ibid.*, 1235.

⁸⁸ *Ibid.*

⁸⁹ *Ibid.*, 1240.

⁹⁰ *Ibid.*, 1270.

⁹¹ *Ibid.*, 1271.

⁹² *Ibid.*, 1270.

establishing “confidence-building measures” which could then foster good-will and the impetus to pursue a voluntary “code of conduct.”⁹³

All three lines of effort could be initially focussed on an area where there exists a natural tendency towards consensus. All space-faring nations are impacted by manmade space-debris which significantly contributes to the congested nature of the domain. Indeed, the handful of times where nations have physically destroyed their own satellites during ASAT tests the resulting “public outcry” has been focussed mainly on the implications of the resulting debris.⁹⁴ It seems plausible that common ground could be sought on this issue in pursuit of a relevant treaty, CIL norms and/or non-binding agreements. For example, experts and academics have proposed three specific guidelines which could garner wide-spread support.⁹⁵ The first specifies that “[i]f an actor wishes to test ASAT capabilities, they should not create debris.”⁹⁶ The second proposes that “[i]f an actor must create debris during an ASAT test, the test should be carried out at an altitude sufficiently low that the debris will not be long-lived.”⁹⁷ The third indicates that “[a]ctors testing ASATs should notify others of their activities in advance (even if they are not completely transparent on the motivation behind the test) to avoid misperceptions.”⁹⁸ These limits on testing could be used as a starting point toward a consensus on a prohibition of the “intentional destruction of objects in orbit” in general via binding or non-binding agreements or CIL norms.⁹⁹

⁹³ Joan Johnson-Freese and David Burbach, 140.

⁹⁴ Porras, 143.

⁹⁵ *Ibid.*, 145.

⁹⁶ *Ibid.*

⁹⁷ *Ibid.*

⁹⁸ *Ibid.*

⁹⁹ *Ibid.*, 143.

Efforts focussed on limiting debris caused by testing would be aligned with the spirit of the “Convention on the Prohibition of Military and Other Hostile Use of Environmental Modification Techniques (ENMOD Convention)” which aims to limit military actions that cause “widespread, long-lasting or severe effects in specified areas including outer space.”¹⁰⁰ ENMOD currently does not apply to destructive, debris causing ASAT tests as the tests are not aimed at negatively altering the space environment specifically to the detriment of other rival states.¹⁰¹

Conclusion

This essay initially summarized the importance of the space domain both for defense and security purposes and modern life in general. The critical nature, ever growing appetite for, and dependence on space-based capabilities has resulted in an environment that is increasingly congested, contested and competitive.¹⁰² This, in turn, has led to the pursuit of ASAT technology and capabilities. Although satellites have been used in support of military capabilities since the beginning of the space age, overt weaponization of space, including the use of ASATs, could have a profound impact on the world. Not only would satellite assets become more at risk to ASATs, jeopardizing crucial access to capabilities essential to today’s society, theorists have surmised that weaponization could effectively lead to space domination by a state or hegemon.¹⁰³ If this were to occur, due to space being the ultimate high ground, an unprecedented period of world domination and empire would ensue.¹⁰⁴ Despite the current practical implications

¹⁰⁰ Tronchetti, 344.

¹⁰¹ *Ibid.*, 345.

¹⁰² Department of Defense and Office of the Director of National Intelligence, *National Security Space Strategy Unclassified Summary*, (Washington, DC, January 2011), 1.

¹⁰³ Havercraft and Duval, 47.

¹⁰⁴ *Ibid.*

of the threat of ASATs on current satellites, and theoretical future implications, the rules governing the use of ASATs are surprisingly unclear and lacking.¹⁰⁵ The Cold War era OST and Partial Test Ban treaties ensure that weapons of mass destruction cannot be used or positioned in space, however there are no other binding treaties or agreements that formally curtail the use of ASATs.¹⁰⁶ There have been attempts to pursue agreements related to PAROS such as the PPWT but these efforts have been largely unsuccessful.¹⁰⁷

This essay has proposed a way forward toward an international framework on ASATs involving three lines of effort. First, the US and Western allies seem to be signalling the need for new binding agreements on weaponization.¹⁰⁸ Momentum on this front should be harnessed and a mechanism to move the ball forward may be within reach in the form of a U.N. resolution currently under consideration.¹⁰⁹ Second, states should take every opportunity to foster the development of CIL regarding ASATs. Destructive ASATs have not been, in fact employed, and indeed are rarely operationally tested.¹¹⁰ This restraint on the testing and use of ASATs gets partway toward establishing CIL for destructive ASAT weapons.¹¹¹ In order to establish CIL, states need to routinely call out any future tests explicitly as illegal as opposed to the current practice of simply opposing or protesting any such tests.¹¹² Third, non-binding agreements should also be sought regarding ASATs. Any such guidelines could stand alone in shaping international

¹⁰⁵ Tronchetti, 332.

¹⁰⁶ Johnson-Freese and Burbach, 137.

¹⁰⁷ Perfilyev, 29.

¹⁰⁸ Sandra Erwin, "U.S. to Support International Effort to Set Rules of Behavior in Space," *Spacenews*, 24 February 2021.

¹⁰⁹ UK Foreign Office, "UK Push for Landmark UN Resolution to Agree Responsible Behaviour in Space," August 26, 2020.

¹¹⁰ Koplav, 1222.

¹¹¹ *Ibid.*, 1240.

¹¹² *Ibid.*, 1235.

understanding, they could also serve to inform efforts on binding treaties or CIL.¹¹³ The three lines of effort should be focussed on a subject area where broad consensus seems to be attainable. Space debris is an indiscriminating hazard to all space-based assets. Destructive ASATs, by their nature, are prone to creating large debris fields which contribute extensively to the congested nature of the space domain.¹¹⁴ States are likely reticent to give up the pursuit of a competitive edge in in the contested and all important domain of space. On the other hand, addressing congestion exasperated by debris caused by ASATs seems like a solid starting point to build consensus.¹¹⁵ Space debris and the space environment impact space-based assets of all relevant actors. Efforts should be focussed to establish, treaties, guidelines and laws with this in mind. Although a ‘giant leap for mankind’ on the issue of regulating ASATs may not be imminent, a series of ‘small steps’ along the proposed lines of efforts and focussed on debris prevention would undoubtedly improve the situation.

¹¹³ *Ibid.*, 1270.

¹¹⁴ Porras, 143.

¹¹⁵ *Ibid.*

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