INCREMENTAL STEPS FOR ACHIEVING SPACE SECURITY: THE NEED FOR A NEW WAY OF THINKING TO ENHANCE THE LEGAL REGIME FOR SPACE

I. INTRODUCTION

Although the realm of outer space has long represented the future of humankind, the development of space technology and the subsequent proliferation of space participants in recent years—encompassing civil, commercial, and military realms—has served notice to the world that the future is rapidly approaching. That said, with the potential weaponization of space on the horizon,[1] policymakers and pundits around the world are quick to acknowledge that the realm of outer space is

1. *See* David Grahame, *A Question of Intent*: *Missile Defense and the Weaponization of Space*, BASIC (BR. AM. SECURITY INFO. COUNCIL) NOTES, May 1, 2002, *available at* http://www.basicint.org/pubs/Notes/2002NMDspace.htm.

the next strategic frontier for international security.[2] Unfortunately, the concept of space security today is still as amorphous as the realm of space is vast. For instance, the public for the most part has failed to differentiate between the militarization and the weaponization of space.[3] Ever since the launching of the first military communication satellites into orbit, the realm of space has been militarized.[4] This reality is evidenced by the fact that militaries around the globe "rely heavily on satellites for command and control, reconnaissance and monitoring, early warning, treaty verification, and navigation with the Global Positioning System (GPS)."[5] While the realm of outer space may be heavily militarized, it is not yet weaponized.[6] Despite this lack of public awareness, the reality of the situation is that the technological superiority and the insecurities of the United States are the true driving forces of the space security dilemma. Ever since the attacks of 9/11, the U.S. government has felt the need to maintain a heightened sense of awareness of the nation's security, or lack thereof, as evidenced by the establishment of the Department of Homeland Security and the accompanying Homeland Security Advisory System.[7] Over the course of President George W. Bush's Administration, the debate conducted in the late 1950s regarding the military uses of space has re-emerged between the hawkish advocates of missile defense and the dovish members of

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2. *See* BARRY WATTS, CTR. FOR STRATEGIC AND BUDGETARY ASSESSMENTS, THE MILITARY USE OF SPACE: A DIAGNOSTIC ASSESSMENT (2001), *available at* http://www.csbaonline.org/4Publications/Archive/R.20010200.The_Military_Use_o/R.20010200.The_Military_Use_o.htm.

3. *See* Sarah Estabrooks, *Opposing Weapons in Space*, PLOUGHSHARES MONITOR, Autumn 2002, *available at* http://www.ploughshares.ca/libraries/monitor/mons02a.html.

4. *Id.* ¶ 3.

5. *Id.*

6. *Id.* ¶ 4. In other words, although space-based devices such as satellites may be used for aggressive military measures, they lack direct destructive capacity and thus are not considered to be space weapons. *Id. See also* BACKGROUND PAPER: "PEACEFUL" AND MILITARY USES OF OUTER SPACE: LAW AND POLICY (Inst. of Air and Space Law, McGill Univ. Faculty of Law ed., 2005).

7. *See* Press Release, The White House, Office of the Press Sec'y, Homeland Security Presidential Directive-3 (Mar. 2002), http://www.whitehouse.gov/news/releases/2002/03/20020312-5.html.

the space arms control community.[8] On one end of the spectrum, space weapons supporters, primarily from the United States, argue that "vulnerability to ballistic missile attack and [the high degree of] dependence on space for various military operations makes defensive measures necessary . . . ."[9] On the other end, members of the arms control community believe the weaponization of space will spiral into a destabilizing arms race making the world less safe and more prone to war.[10] Unfortunately, each side has become so entrenched in the validity of their own ideological belief that the channels of communication between the two sides have been all but closed.[11]

In light of all these factors muddying the waters of the space security debate, the largest yet most overlooked problem in the space security dilemma is the inadequacy of the current international legal regime for space. The Bush Administration has already demonstrated its resolve by officially withdrawing from the thirty-year old Anti-Ballistic Missile Treaty (ABM),[12] which leaves the 1967 Outer Space Treaty (OST)[13] as the primary current legal bar on space weaponization.[14] Over the course of his final term, President Bush is likely to pursue space weapons with even greater intensity for both missile defense

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8. *See* James C. Moltz, *Breaking the Deadlock on Space Arms Control*, ARMS CONTROL TODAY, Apr. 2002, http://www.armscontrol.org/act/2002_04/moltzapril02.asp.

9. *Id.*

10. *Id.*

11. *See id.*

12. *See* Manuel Perez-Rivas, *U.S. Quits ABM Treaty*, CNN, Dec. 4, 2001, http://archives.cnn.com/2001/ALLPOLITICS/12/13/rec.bush.abm/. The United States officially withdrew from the ABM Treaty on June 13, 2002. *See* Press Release, The White House, Office of the Press Sec'y, Statement by the President (June 13, 2002), http://www.whitehouse.gov/news/releases/2002/06/20020613-9.html; *see generally* Treaty on the Limitations of Anti-Ballistic Missile Systems, U.S.-U.S.S.R., May 26, 1972, 23 U.S.T. 3435.

13. *See* Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205.

14. Grahame, *A Question of Intent*: *Missile Defense and the Weaponization of Space*, *supra* note 1, ¶ 3. "While the OST bans the placing of weapons of mass destruction in space, on the moon or other celestial bodies, it has no prohibitions on other weapons systems." *Id.*

and anti-satellite mechanisms (ASAT).[15] Indeed, the future of space security will depend greatly on how effectively the weaknesses of the current legal regime are addressed[16] and on whether the United States and the international community can set aside their differences and come together in an effort to strengthen the current legal regime. If they cannot, outer space will become even more susceptible to the exploitation of these space stakeholders and their need to protect and promote their space interests. Consequently, the purposes of this Article are: (1) to identify the glaring holes in the current legal regime for space and how they came about; (2) to understand the major impediments to achieving progress in strengthening the regime; and finally, (3) to suggest incremental steps of strengthening the legal regime with the end goal of enhancing space security.

II. AN EXAMINATION OF THE CURRENT LEGAL REGIME FOR SPACE IS NECESSARY TO DETERMINE HOW TO IMPROVE IT

Since the legal regime for space has long been unable to keep pace with the challenges of the ever-increasing use of space,[17] it is vital to reassess its current state in an effort to understand why it is so porous and how it can be improved. First, we must look to the origins of the current regime and the technological and political environment at the time of the promulgation of the regime. By analyzing how the space environment has evolved since then, we can begin to understand why the shortcomings of the current regime exist, and hopefully, how to address them.

A. The Origins of the Space Regime

On October 4, 1957, the United Soviet Socialist Republic (U.S.S.R.) stunned the world—and in particular, the United States—by launching the first artificial Earth satellite into

15. *See generally* George W. Bush, President of the United States, State of the Union Address (Jan. 31, 2006), *available at* http://www.whitehouse.gov/stateoftheunion/2006/print/index.html.

16. *See* Nina Tannenwald, *Law Versus Power on the High Frontier: The Case for a Rule-Based Regime for Outer Space*, 29 YALE J. INT'L L. 363, 365 (2004).

17. *Id.* at 370.

orbit.[18] This monumental event not only marked the dawn of the space age, but it also served as the first salvo of the U.S.-U.S.S.R. space race.[19] Shortly thereafter, in 1958, the United Nations formed an ad hoc group called the Committee on the Peaceful Use of Outer Space (COPUOS) for the purpose of governing the then nascent realm of space.[20] With the inception of COPUOS a regime had finally been established to study and address the legal issues arising from the exploration of outer space.[21] Since then, COPUOS has become a permanent part of the United Nations—working through the Outer Space Affairs Division—and has grown from eighteen to sixty-seven nations.[22]

Soon thereafter, the U.N. General Assembly adopted the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space[23] in 1962[24] for the purpose of facilitating "broad international co-operation in the scientific as well as in the legal aspects of exploration and use of outer space for peaceful purposes."[25] Today, the international legal regime consists of several general principles expressed in five space treaties, a number of arms control treaties, and some general principles of international law.[26]

Although international space law has derived many of its policies from the basic principles set forth by COPUOS, few in the international space law community would argue that the OST is the most significant legal text governing the realm of

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18. *See* Steve Garber, *Sputnik and the Dawn of the Space Age*, NASA, http://history.nasa.gov/sputnik/index.html (last visited Apr. 9, 2006).

19. *Id.*

20. *See generally* U.N. Office for Outer Space Affairs, U.N. Committee on the Peaceful Uses of Outer Space: History and Overview of Activities, http://www.unoosa.org/oosa/COPUOS/cop_overview.html (last visited Apr. 9, 2006). COPUOS had four initial objectives, one of which was to consider "the activities and resources of the United Nations, the specialized agencies and other international bodies relating to the peaceful uses of outer space." *Id.*

21. *Id.*

22. *See id.*

23. G.A. Res. 1962 (XVIII), U.N. Doc. A/RES/1962 (Dec. 24, 2963), 3 I.L.M. 157.

24. G.A. Res. 1962, *supra* note 23.

25. *Id.*

26. Tannenwald, *supra* note 16, at 370 (citations omitted).

outer space.[27] Part of the reason the OST—which entered into force in October 1967—is so revered is that it not only became the first treaty to govern access to space, but more pertinently, it was the first to address the issue of space weaponization.[28] The fundamental premise of the OST is that space is not open to national appropriation but should be reserved for the pursuit of the common interest of mankind and for "peaceful purposes."[29] The underlying goals of the OST are to avoid colonial competition in space and to avert an extension of the Cold War's dangerous military rivalry.[30] The OST provides the basic framework for international order in outer space, introducing principles that have since been elaborated on in later treaties.[31] However, due to the few number of states that are capable of operating in space, the OST has been largely untested, and its principles have been by and large aspirational.[32]

Other agreements are relevant to the weaponization debate, and while they must be acknowledged, they primarily serve as a backdrop for the legal regime for space created by the OST. In particular, the Limited Test Ban Treaty of 1963 banned nuclear weapons testing in outer space while several subsequent treaties and declarations regulated different forms of military activity in space.[33] Finally, four other General Assembly resolutions are worth noting to fill out the remainder of the legal landscape of the weaponization issue: the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Use and Benefit and in the Interest of All States[34] and the

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27. *See* CARL Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 19–20 (1982) (recognizing that the 1967 OST is "the main base for the legal order of the space environment").

28. Estabrooks, *supra* note 3, ¶ 6.

29. *Id.*

30. CDI Fact Sheet: Legal Aspects Concerning the Militarization of Space, http://www.cdi.org/missile-defense/space.pdf (last visited Apr. 9, 2006).

31. *See* MICHAEL KREPON & CHRISTOPHER CLARY, SPACE ASSURANCE OR SPACE DOMINANCE?: THE CASE AGAINST WEAPONIZING SPACE 94–95 (2003), *available at* http://www.stimson.org/pub.cfm?id=81.

32. Tannenwald, *supra* note 16, at 370.

33. *See* KREPON & CLARY, *supra* note 31, at 94–5.

34. Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account

resolutions on Direct Television Broadcasting,[35] on Remote Sensing of the Earth from Outer Space,[36] and on the Use of Nuclear Power in Outer Space.[37]

B. The Evolution of the Space Environment

The ingenuity of the human race has led to breakthroughs in space technology that have reduced the once insurmountable costs of space access.[38] As a result, the world is witnessing a rapid proliferation of new space actors as well as an increasing commercialization of space.[39] In light of these facts it is impossible to deny that space is the next strategic frontier, both militarily and economically speaking. Unfortunately, the creators of the current legal regime for space failed to foresee the rate at which these advancements would take place, and as a result, the shortcomings in the current regime beg the question of whether law can keep up with technology.

1. New Actors Due to the Commercialization of Space

The current legal regime for space was created during an era of superpower bipolarity in which the United States and the U.S.S.R. enjoyed a "near-monopoly on access to advanced orbital systems and capabilities."[40] Today, however, an increasing number of actors have entered into the fray in the form of industrialized nations, private commercial enterprises, or even individuals. Each of these actors has gained access to space

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the Needs of Developing Countries, G.A. Res. 51/122, U.N. Doc. A/Res/51/122 (Dec. 13, 1996).

35. Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, G.A. Res. 37/92, U.N. Doc. A/Res/37/92 (Dec. 10, 1982).

36. Principles Relating to Remote Sensing of the Earth from Outer Space, G.A. Res. 41/65, U.N. Doc. A/Res/41/65 (Dec. 3, 1986).

37. Principles Relevant to the Use of Nuclear Power Sources in Outer Space, G.A. Res. 47/68, U.N. Doc. A/Res/47/68 (Dec. 14, 1992).

38. *See* William W. Bruner III, *National Security Implications of Inexpensive Space Access*, http://www.fas.org/spp/eprint/bruner.htm (last visited Apr. 9, 2006).

39. WATTS, *supra* note 2, ¶ 2.

40. *Id.* ¶ 1*; see also* Major Elizabeth S. Waldrop, *Integration of Military and Civilian Space Assets: Legal and National Security Implications*, 55 A.F. L. REV. 157, 159 (2004).

services that have long been the exclusive realm of the American and Soviet governments.[41]

One of the primary reasons for the rapid proliferation of space actors in recent years is the growing realization that the space industry will continue to play a vital role in the growth of the world's national economies. In 1996, global space industry revenue from commercial sources exceeded revenue earned from government spending on space activity for the first time (fifty-three percent to forty-seven percent of total revenue, respectively).[42] According to a report from the Department of Commerce, "the markets for commercial space transportation, satellite communications, space-based remote sensing, and satellite navigation totaled over $80 billion in global revenues in 2000."[43] In addition to revenues, it has been reported that more than 800,000 people worldwide have been employed by the space industry since 1996.[44] Some of the most profitable high-tech economic sectors in the world, such as software and hardware development and telecommunications, have been fueled by civilian space activities.[45] In the United States alone space-technology industries have generated approximately $125 billion worth of profits in 2000, and it is estimated that by 2010 U.S. investment in outer space could reach as high as $600 billion, which would be comparable to the total current U.S. investment in Europe.[46]

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41. WATTS, *supra* note 2, ¶ 2.

42. David M. Livingston, *The Prospects for Space Commerce in the Aftermath of 9–11* (2002), http://www.spacefuture.com/archive/the_prospects_for_space_commerce_in_the_aftermath_of_9_11.shtml.

43. Press Release, Dep't of Commerce Tech. Admin., Commerce Report Forecasts Continued Growth in Commercial Space Industry (June 5, 2001), http://www.technology.gov/Prel/pr010607.htm (noting that this revenue figure represents an increase of $8 billion from 1999 and is expected to rise significantly in the near future due to an increasing demand for satellite communications services).

44. Johannes M. Wolff, *'Peaceful Uses' of Outer Space Has Permitted its Militarization—Does it Also Mean Its Weaponization?*, 2003 DISARMAMENT FORUM 5, 9, *available at* http://www.unidir.ch/pdf/articles/pdf-art1883.pdf.

45. *Id.*

46. Thomas Graham, Jr., Ambassador, Future of International Cooperation in Space, Presentation Before the National Security and Military Space Workshop ¶ 3 (Jul. 8–9, 2003), http://www.eisenhowerinstitute.org/programs/globalpartnerships/fos/newfrontier/grahampaperjuly2003.htm.

Unfortunately, the creators of the legal regime failed to recognize the ability of industry, as a semi-independent actor, to influence the security agenda for space. One of the consequences of the rising prominence of the space industry has been the continual reduction in the enormous costs of space launches, thus allowing more nations the opportunity to access space by establishing their own civil space programs. Today, over thirty nations have developed, or are developing, space flight programs.[47] Just as importantly, the space industry also exerts leverage in encouraging the development of various capabilities that might not otherwise be funded.[48] Although governments have a number of tools at their disposal to exercise control over industry,[49] commercial entities have enjoyed a certain degree of independence. This independence only serves to complicate the space security regime.[50] Finally, the development of trade and commercial cooperation that resulted from the commercial space sector boom has provided a conduit for the spread of technology among these new space actors, thereby bolstering a nation's space capabilities.[51] As these commercial capabilities continue to proliferate, the number of new space actors is certain to grow, and the legal regime must be prepared for it this time.

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47. Tomomasa Nagano, *Space and Security* ¶ 3 (2004), http://www.spusa.org/issue/spaceandsecurity/space_brief.html (on file with *Houston Journal of International Law*).

48. European industry's role in driving Galileo to fruition is one important case in point. *Galileo: European Satellite Navigation System*, DIRECTORATE-GENERAL ENERGY AND TRANSPORT, http://europa.eu.int/comm/dgs/energy_transport/galileo/partners/private_intro_en.htm (last visited Apr. 9, 2006).

49. Control tools include shutter control and ultimate authority to acquire control over ground segments of space systems on its territory. James D. Rendleman, Colonel, U.S. Air Force, Speech at the Conference Toward Fusion of Air and Space: Surveying Developments and Assessing Choices for Small and Middle Powers, International Military Space Operations and Integration 33 (Mar. 2001), *available at* http://www.rand.org/pubs/conf_proceedings/CF177/CF177.ch2.pdf.

50. *Cf.* Graham, Future of International Cooperation in Space, *supra* note 46, ¶ 10 (referring to nations developing their own space programs to gain the rewards of the proliferation of space technology for their own purposes, and this multiplicity of actors creates instability in the current security regime).

51. *Id.* ¶ 13.

2. The Reality of Space Weapons

The second major aspect in which the space environment has evolved since the creation of the legal regime is the reality of space weapons technology. The debate over space weaponization is far from the theoretical discussion debated by the founders of the current legal regime. One particular display of how far the debate has progressed is the billions of dollars the United States continues to invest into the research and development of advanced space weapons like the Space Based Laser (SBL).[52] In fact, recent leaps in space technologies have put the development of space weapons within the realm of possibility for several different countries.[53] As *New World Vistas: Air And Space Power For The 2lst Century*, a U.S. Air Force board report, states, "In the next two decades, new technologies will allow the fielding of space-based weapons of devastating effectiveness to be used to deliver energy and mass as force projection in tactical and strategic conflict. These advances will enable lasers with reasonable mass and cost to affect very many kills."[54]

As these space weapons move closer to becoming reality, it is apparent that the legal regime must be ready to deal with these sorts of weapons for the sake of space security.

C. The Inability to Attain Consensus on Major Definitional Aspects of Weaponization

Although the evolution of the space environment and technology have had a great deal to do with the instability of space, the numerous definitional ambiguities plaguing the current regime and the inability to attain any consensus on critical terms have played a significant role in the ineffectiveness of the current regime. The following subparts highlight the major definitional aspects of weaponization that

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52. Grahame, *A Question of Intent*: *Missile Defense and the Weaponization of Space*, *supra* note 1, ¶ 3.

53. Jayantha Dhanapala, Under Sec'y Gen. for Disarmament Affairs, United Nations, Opening Remarks at the Outer Space Treaty at Thirty-Five ¶ 9 (Oct. 14, 2002).

54. Karl Grossman, U.S. Military Moves *to* "Control Space" and be "Enforcement Arm for the Global Economy," Presentation at the Technology and Globalization Teach-In ¶ 28 (Feb. 24, 2001), *available at* http://www.envirovideo.com/karltechglobe.html.

have not been addressed and explain why they have not.

1. What Is a Space Weapon?

The current legal regime does not specifically define, nor is there a clear consensus on, what exactly is a space weapon.[55] The debate over the definition encompasses the problems of whether or not the international community should include in the definition of a space weapon "both weapons and targets located in space, direct and indirect applications of force, and the possibility of temporary impairment as well as permanent destruction."[56] A 1998 working group of the United Nations Institute for Disarmament Research (UNIDIR) attempted to define a space weapon as "a device stationed in outer space (including the moon and other celestial bodies) or in the earth['s] environment designed to destroy, damage or otherwise interfere with the normal functioning of an object or being in the earth['s] environment."[57] Certain technologies that were created with the capability and intent of degrading or destroying—such as space-based directed energy weapons,[58] space-based kinetic weapons, and certain anti-satellite satellites (ASAT)—fit the traditional definition of space weapon.[59]

However, other technologies are more difficult to

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55. *See* S. Chandrashekar, *Problems of Definition: A View of an Emerging Space Power*, *in* PEACEFUL AND NON-PEACEFUL USES OF OUTER SPACE: PROBLEMS OF DEFINITION FOR PREVENTION OF AN ARMS RACE 77, 86–87 (B. Jasani ed., 1991) (listing characteristics of space weapons); s*ee also* Estabrooks, *supra* note 3, ¶ 6 (identifying Canada's simple definition: "[A] weapon is space-based if it orbits the earth at least once, or has or will acquire a stable station at some point beyond earth orbit.")

56. *See* Chandrashekar, *supra* note 55, at 77-97; *see also* REPORT OF THE PERMANENT MISSION OF THE PEOPLE'S REPUBLIC OF CHINA TO THE UNITED NATIONS, DEFINITION ISSUES REGARDING LEGAL INSTRUMENTS ON THE PREVENTION OF WEAPONIZATION OF OUTER SPACE II, June 9, 2005, *available at* http://www.china-un.ch/eng/cjjk/cjjzzdh/t199362.htm; B. Jasani, *Introduction* to PEACEFUL AND NON-PEACEFUL USES OF OUTER SPACE: PROBLEMS OF DEFINITION FOR PREVENTION OF AN ARMS RACE 13 (B. Jasani, ed., 1991).

57. Jasani, *supra* note 56, at 13.

58. *See* Estabrooks, *supra* note 3, ¶ 6. Space-based directed energy weapons may come in the form of lasers or radio frequencies to destroy the target upon direct impact. *Id.*

59. *See* William Marshall et al., *Space Weapons: The Urgent Debate* 9 (Draft paper, 2003), *available at* http://www.student-pugwash.org/halifax2003/papers/Marshall.pdf.

categorically classify. For example, certain technologies have blurred the boundaries between space-based and space-transiting weapons by the simple strategy of temporarily placing weapons that orbit for only a few days or weeks.[60] Equally as ambiguous are the growing number of technologies that merely deny or disrupt the space activities of other space actors, including certain ASATs that serve to deny access to satellite or ground systems via passive measures such as encryption, ground-based jamming, or even suborbital intercept missiles for missile defense.[61]

Certain technologies outside the scope of the traditional definition of space weapons may deserve the most immediate attention because they are likely to be deployed in the near term and could realistically facilitate the deployment of more traditional space-based weapons.[62] Determining a clear definition, agreed upon by all states of what is and what is not a space weapon, should be the first priority of any effort to improve the current legal regime for space.

2. The Ambiguity of Peaceful Purposes

In the process of banning the placement of weapons of mass destruction (WMD) in orbit and the establishing of military bases in space, the OST codified the term "peaceful use of outer space." However, no consensus has been reached as to an operational definition of "peaceful."[63] In fact, in many nations, the term "peaceful" has become synonymous with the term "non-aggressive" rather than "non-military" thereby implying that "all military uses were and are allowed and lawful as long as they remain 'non-aggressive' as permitted under Article 2(4) of the United Nations Charter, which basically prohibits 'the threat or use of force.'"[64]

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60. *Id.* Canada, like many in the international community, considers a weapon to be space-based if it "orbits the earth at least once, or has or will acquire a stable station at some point beyond earth orbit." Estabrooks, *supra* note 3, ¶ 6.

61. *See* Marshall, *supra* note 59, at 8–9.

62. *Id.* at 10.

63. *See* Estabrooks, *supra* note 3, ¶¶ 7, 10.

64. Wolff, *supra* note 44, at 8 (citing McDougal et al., *Law and Public Order*, no. 5, 397–99 (1985)).

Consequently, space powers have determined that military support activities such as observation, surveillance, communications, and the detection of nuclear explosions on Earth are "passive" and thus fall under the umbrella of "peaceful purposes."[65] Ironically, it was the United States in 1957 that initially proposed outer space be used exclusively for peaceful and scientific purposes.[66] Since then, however, the U.S. State Department has been quick to point out that the term peaceful purposes, according to the current regime, allows for "non-aggressive" measures of space militarization based on the reasoning that the OST did not intend to prevent sovereign states the right to protect their nation and their space assets.[67]

In light of the potential offensive and defensive weapons and deployments in outer space, the belief that the current legal regime promotes the peaceful use of outer space, in the strictest sense, is naïve at best.[68] With the militarization of space and the increasing military reliance on space-based intelligence, surveillance, and navigation assets, it is not difficult to imagine the increasing specter of weaponization.[69] While all hope for preserving space for peaceful purposes is not lost, we must narrow the definition of peaceful purposes if progress is to be achieved. The era of space as a truly peaceful sanctuary may be gone, but it may not be too late to regulate space activities in an effort to mitigate the potential of space weaponization.[70]

3. The Lack of Limitations on Dual-Use Technologies

Integrally related to the first two ambiguities in the legal regime is the increasingly troubling aspect of the development and acquisition of equipment with "dual-use" potential. The term dual-use, originally used in the context of nuclear

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65. *See* Abram Chayes et al., *Space Weapons: The Legal Context*, *in* WEAPONS IN SPACE 193, 196–97 (Franklin A. Long et al. eds., 1986).

66. President Dwight D. Eisenhower and UN Ambassador Henry Caboot Lodge, 36 Dep't of State Bulletin 124, 227 (1957); U.S. Sec'y of State John Foster Dulles, 37 Dep't of State Bulletin 271 (1957).

67. *See* Chayes, *supra* note 65, at 196–97.

68. *See* Wolff, *supra* note 44, at 8.

69. *See id.*

70. *See id.*

technology that could be used for both military and peaceful aims, has taken a slightly different meaning in the context of space.[71] In recognizing that space has long been a realm where commercial and military interests have co-existed,[72] the term dual-use addresses the potential of a space weapon to be both a defensive and devastatingly offensive tool.[73] It is vital to consider the clear dual-use potential of advanced systems envisioned by the United States as part of a space-based missile defense system.

The most prominent of the potential dual-use programs is the Space Based Laser (SBL), which is designed to operate in Low Earth Orbit for the purpose of destroying "hostile ballistic missiles during their boost phase of flight."[74] Military officials have discussed the potential usefulness of the SBL in enhancing U.S. force projection from space.[75] In fact, these officials have gone so far as to suggest that "SBLs could form the replacement for the B-2A Spirit bomber, using directed energy to destroy ground based targets."[76] The Missile Defense Agency (MDA) is also in the process of developing a space-based defense option in the form of kinetic kill vehicles.[77] Similar to the SBL, this particular system would seek to destroy enemy ballistic missiles during the boost phase. However, kinetic kill vehicles would accomplish this by the deployment of hundreds of small

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71. *See* OFFICE OF THE SEC'Y OF DEFENSE, NUCLEAR WEAPONS SYSTEM SUSTAINMENT PROGRAM ANNEX C (1997), *available at* http://www.defenselink.mil/pubs/dswa/document.html.

72. Graham, Future of International Cooperation in Space, *supra* note 46, ¶ 2. "Remote sensing, telecommunications, and satellite-based navigation systems are all commercially available space applications that have dual-use potential" in the traditional context because of the military's use of the same space technology for reconnaissance and early warning. *Id.* ¶ 13.

73. *See generally* Ambassador Thomas Graham, *International Law and the Military Uses of Space*, DISARMAMENT DIPLOMACY, Mar.-Apr. 2002.

74. Grahame, *A Question of Intent*: *Missile Defense and the Weaponization of Space*, *supra* note 1, ¶ 10.

75. *Id.*

76. *See id.* ¶ 13; *see also* Paul Rogers, *Towards an Ideal Weapon? Military and Political Implications of Airborne and Space-Based Lasers*, 17 DEF. & SEC. ANALYSIS 73, 82–83 (2001).

77. Grahame, *A Question of Intent*: *Missile Defense and the Weaponization of Space*, *supra* note 1, ¶ 14.

satellites around the earth rather than by one centralized laser.[78] Needless to say, it is feasible to see how such a defensive space network could be modified to offensively threaten the space assets of other nations.[79]

Unfortunately, the creators of the current legal regime did not foresee the extent to which space technology would develop in such a short period of time. Nevertheless, if the international community seeks to establish a sustainable security regime for space, it is imperative that a reasonable balance is struck between the need to defend the principle of universal space access and desire to prevent the application of dual-use technology in space for destructive purposes.

III. THE CURRENT LEGAL REGIME FOR SPACE CAN ONLY BE ENHANCED IF U.S. INTERESTS AND CONCERNS ARE ADEQUATELY ADDRESSED

For better or for worse, the Bush Administration, like-minded members of Congress, and the U.S. military are the only vocal proponents of space weaponization.[80] These advocates of weaponization base their argument on three major assumptions: inevitability, vulnerability, and control.[81] The core of the inevitability argument is that weapons in space are virtually unavoidable. Consequently, the United States must stay ahead of the curve to maintain a maximum level of security.[82] The vulnerability argument relies on the fears many Americans have in regards to the increasing number of threats in today's world and the need to provide protection from these various threats.[83] Finally, in light of all of the advantages space has to offer, the control argument focuses on the American desire to expand upon

78. *Id.*

79. *Id.*

80. *See* Theresa Hitchens, *Rushing to Weaponize the Final Frontier*, ¶ 3 (2001), http://www.armscontrol.org/act/2001_09/hitchenssept01.asp.

81. Rebecca Johnson, *Space Security: Options and Approaches*, ¶ 21 (2002), http://www.ploughshares.ca/libraries/Abolish/OuterSpaceConfGeneva02/JohnsonConf2002.htm.

82. *See id.* ¶ 4.

83. *See id.*

its current dominance in space.[84]

Justifiable or not, these assumptions are based on the interests and concerns of the only nation in the world that poses the ability to present a legal barrier to preserving the realm of space as a sanctuary.[85] Unfortunately, the arms control community has continually failed to adequately address these American interests and concerns regarding space. The United States is driving the debate on space weaponization, and the arms control community must learn to speak the "language" of the U.S. Government if any progress is to be made. If those in favor of arms control cannot learn to speak the language of these weaponization advocates, the natural path of the debate will spiral into a perilous free-for-all towards space weaponization.

A. In Order to Counter the Inevitability Argument, Arms Controllers Must Acknowledge That Norms Alone Will Be Insufficient in the Future

The simplest argument for space weaponization (inevitability) may also be the most reckless because of its self-fulfilling nature. Proponents of the inevitability of space weaponization have proffered multiple theories as to why the realm of space will eventually become weaponized.[86] According to the logic of these inevitability proponents, the United States should lead the way rather than be left in the dust as military technology continues to rapidly develop.[87] However, while the inevitability argument may have some merit, its true danger lies in its unverifiable nature until weaponization actually occurs. Moreover, it is important to note that this premise is driven not only by American insecurities, but also by the need for the United States to control its own future. Since the ideological divide between "space doves" and those who believe space weaponization is inevitable is not likely to be bridged soon, the international community must recognize the need for a legal

84. *See id.*

85. *See id.* ¶ 36.

86. *See* Karl P. Mueller, Is the Weaponization of Space Inevitable?, Presentation at the International Studies Assoc. Annual Convention ¶ 1 (Mar. 27, 2002), *available at* http://www.isanet.org/noarchive/mueller.html.

87. *Id*.

regime for space with teeth—or, put another way, a legal regime that goes beyond simply establishing a set of norms that have little to no consequences.

1. The Self-Fulfilling Prophecy of the "Need" for Space-Based Military Defense

> We know from history that every medium—air, land and sea—has seen conflict. Reality indicates that space will be no different. Given this virtual certainty, the United States must develop the means both to deter and to defend against hostile acts in and from space. This will require superior space capabilities.[88]

In 2000, Secretary of Defense Donald Rumsfeld chaired the Commission to Assess United States National Security Space Management and Organization. The Commission warned of a "space Pearl Harbor" if the United States did not move to defend its space assets.[89] The statement above from the Rumsfeld Commission summarized the sentiment of many hawks in the United States about the need to achieve space dominance in order to achieve the best possible space security.[90] Accordingly, this view of space by weapons proponents not only justifies military support missions, but also lends support to the justifiable application of military force through the use of weapons stationed in space.[91]

The fallacy of the inevitability argument is that, in the short run at least, the United States is the only country that possesses the resources and capabilities necessary to deploy space weapons.[92] This has never been the case in American history. As one historian notes, from the "development of ironclad warships in the 1860s, Dreadnought battleships after 1900, or atomic weapons in the 1940s," different nations were simultaneously

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88. *See Report of The Commission to Assess United States National Security Space Management and Organization*: S. HRG. 107–640 *Before the Subcomm. on Strategic Forces of the S. Comm. on Armed* Services, 117th Cong. 154 (2001) [hereinafter Rumsfeld Commission].

89. *Id.* at 31–32.

90. *Id.*

91. Tannenwald, *supra* note 16, at 24.

92. Mueller, *supra* note 86, ¶ 13.

developing the same technology.[93] This left a choice to the different governments to either take the lead in the arms race or get passed by.[94] In the space weapons debate, in contrast, "the United States can unilaterally [for the time being] choose whether space will be weaponized."[95] Consequently, the United States controls the inevitability of space weaponization. This conviction is dangerously close to evolving into a self-fulfilling prophecy that simply cannot be refuted.[96]

While the realms of air, land, and sea have already been weaponized, presumably irrevocably so, they have become so as a result of three very different paths.[97] Moreover,

> the evolutionary patterns of military and commercial uses of new environments have [also] varied widely across the range of human experience. To conclude that this evidence proves that the fourth will also be weaponized would require a degree of deterministic fatalism that would make the most doctrinaire Marxist or environmental doomsayer blush.[98]

The question of whether weaponization will occur is still yet to be determined, but it will undoubtedly be affected by the decisions of U.S. military space policymakers in the coming years.[99] Because the choices ahead are so important, it would be irresponsible of the United States to rely solely on an argument lacking in critical analysis and "based upon little more than superficial historical analogies and glib strategic aphorisms."[100] The bottom line is that the use of the word "inevitable," in the context of the weaponization of space, is dangerous simply

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93. *See id.*

94. *See* Karl P. Mueller, *Space Weapons and U.S. Security: The Dangers of Fortifying the High Frontier*, SECURITY STUDIES (Paper presented at the International Studies Association Annual Convention, New Orleans, Mar. 27, 2002), *available at* http://www.isanet.org/noarchive/mueller.html.

95. *See* Mueller, *supra* note 86, ¶ 13.

96. *See id.*

97. *Id.* In addition to defining what a space weapon is, the space weaponization debate, unlike the realms of land and sea, also varies depending on how an individual defines the arena of space. *Id.*

98. *Id.* ¶ 29.

99. *Id.* ¶ 58.

100. *Id.*

because there are too many variables to be able to discern the future with any degree of certainty at this point.[101]

2. The True Need: A Legal Regime with Teeth

The inevitability argument, despite its deficiencies, offers some valuable insight into the American psyche and the nation's never-ending quest for greater security. With no end in sight to the ideological debate of how much security space weaponization would provide, an ideological compromise must be established for the sake of progress and future space security. The current regime, with the OST in particular, has established a norm in support of the maintenance of outer space for peaceful purposes.[102] This norm has been sustained for nearly forty years, and in the process, it has ensured that the realm of space would not be used as a battleground for international actors to settle their disputes.[103] Unfortunately, this normative standard has become so diluted and ambiguous that it carries practically no weight at all.[104]

One of the clearest indications of the declining utility of a strictly norm-based legal regime is the continuing crisis over North Korea's pursuit of nuclear weapons.[105] Although this example involves WMD policy rather than space weapons policy, it still reflects the lack of effectiveness of the arms control approach.[106] In 1993, Pyongyang defied the nuclear nonproliferation regime by pursuing nuclear weapons in violation of its treaty commitments.[107] The eventual result of months of protracted negotiations between the United States and North Korea was the October 1994 Agreed Framework in

101. *Id.*

102. *See* Estabrooks, *supra* note 3, ¶¶ 1–2. The U.N. General Assembly First Committee annually reinforces this particular norm with a vote on the Prevention of an Arms Race in Outer Space Resolution. *Id.* ¶ 11.

103. *See id.* ¶ 6.

104. *See id.*

105. *See* David P. Fidler, *International Law and Weapons of Mass Destruction: End of the Arms Control Approach?*, 14 DUKE J. COMP. & INT'L L. 39, 85 (2004); *see also Nuclear Weapons on the Korean Peninsula*, ARMS CONTROL TODAY, May 2003, at 3, http://www.armscontrol.org/act/2003_05/nkoreaintro_may03.asp.

106. *See supra* note 105.

107. *See Nuclear Weapons on the Korean Peninsula*, *supra* note 105.

which the two nations facilitated an exchange of U.S. oil, economic cooperation, and construction of two light-water nuclear power plants for North Korea's promise to shut down its plutonium-based nuclear reactor and related facilities.[108]

More recently in October 2002, the Bush Administration announced that Pyongyang had admitted to developing an illicit uranium-enrichment program.[109] North Korea has subsequently ejected international arms inspectors, announced its withdrawal from the Non-Proliferation Treaty (NPT), and restarted its frozen nuclear reactor.[110] The reality is that neither the NPT nor the 1994 Agreed Framework has been able to deter Pyongyang from pursuing nuclear weapons capability.[111] While these norms can be reinforced, the lack of determination to resolve the current crisis in North Korea—which in all likelihood may require multilateral diplomacy or preemptive military action by the United States—lends credence to the belief that the era of a strictly normative-based legal regime is gone.[112]

Some have taken a slightly different spin by advocating "a more elaborated [normative] legal regime" for the future of space.[113] In this approach, rather than striving for an operational regime based largely on a freedom of the seas analogy, the international community plays more of an active role in negotiating rules to ensure that commercial, security, and scientific interests in space are secured.[114] Like the established normative regime, this approach emphasizes international cooperation among all parties with an interest in space. However, this approach differs by advocating widespread participation by even nonstate actors in decision-making and rulemaking regarding space.[115] The ultimate distinction in a more fully elaborated normative regime is that the rules normally embodied in treaties would be designed to prevent the

108. *Id.*
109. *Id.*
110. *Id.*
111. Fidler, *supra* note 105.
112. *See id.*
113. *See* Tannenwald, *supra* note 16, at 370.
114. *See id.* at 370–71.
115. *See id.* at 371.

predominance of any single power in space.[116]

Unfortunately, this idealistic vision of an enhanced and elaborated normative regime is destined to fail if it does not take into consideration the realist-minded security concerns of the United States. These concerns are namely the lack of universal political will to prevent the weaponization of space and the belief that other nations have incentives to weaponize space exclusive of the desire to counter U.S. weaponization efforts.[117] First, without consensus among the nations or any universal political will against weaponization, it will be difficult, if not impossible, to enforce a boundary between where war is acceptable and where it is not.[118] Second, according to many inevitable weaponizers, even

> if the United States chooses not to build space weapons, other countries will certainly do so, in large part because of the great and still growing degree to which U.S. military operations depend upon what has traditionally been known as "space force enhancement,"[119] . . . without which American military power would be crippled.[120]

In other words, why do arms controllers presume that other states will not seek to weaponize space simply to counter the operational advantages the United States currently enjoys there?

Without universal political will and without addressing the fact that other nations have an incentive of weaponizing space even if the United States chooses not to, arms control will continue to be a weak, though not entirely irrelevant, tool.[121] If arms control is to be successful, it must reflect political realities.

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116. *See id.* at 379.

117. *See* Steven Lambakis, *Putting Military Uses of Space in Context*, *in* FUTURE SECURITY IN SPACE: COMMERCIAL, MILITARY, AND ARMS CONTROL TRADE-OFFS 23, 26 (James C. Moltz, ed. 2002), *available at* http://cns.miis.edu/pubs/opapers/op10/op10.pdf.

118. *See id.*

119. Mueller, *supra* note 86, ¶ 37. "'Space force enhancement': is the use of satellites to provide a vast array of services including communications, reconnaissance, navigation, and missile launch warning." *Id.*

120. *Id.*

121. Lambakis, *Putting Military Uses of Space in Context*, *supra* note 117, at 26.

To paraphrase the National Rifle Association's slogan[122] as to why guns should not be banned, outlawing space weapons via disarmament treaties will only restrict the law-abiding, but not the outlaws themselves.[123] It goes without saying that the legal regime for the future of space must include rules embodied in treaties and must be predicated upon fundamental principles of international cooperation.[124] However, because different governments have different ambitions and policy objectives,[125] the new regime must consider the possibility of including both arms control provisions and provisions allowing certain weapons as equally effective instruments of policy.[126] Norms used to be sufficient in a simpler time, but the space environment has changed. Norms simply will not be sufficient any more.

B. The Arms Control Community Must Reconcile the Specter of an Increasing Number of Space Threats with a Nation's Inviolable Right to Self-Defense

The vulnerability argument for justifying space weaponization revolves around the right conferred upon all nations in Article 51 of the U.N. Charter, which states that all Member States have the inherent right of individual and collective self-defense.[127] As it becomes increasingly clear that the well-being of the United States depends on the ability to operate in space, the Bush Administration is seeking to utilize its technological dominance in the next strategic frontier to provide as much security as possible.[128]

The critical question in light of the increasing number of potential threats is, what further steps must be taken to

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122. *Rule of Law Returns at Wrong Time Wrong Place*, GARY POST TRIBUNE, 16, 2005, *available at* http://www.galleryofguns.com/shootingtimes/Articles/DisplayArticles.asp?ID=7400.

123. Lambakis, *Putting Military Uses of Space in Context*, *supra* note 117, at 26.

124. *See generally* Tannenwald, *supra* note 16, at 420.

125. *See* Lambakis, *Putting Military Uses of Space in Context*, *supra* note 117, at 26.

126. *Id.* (reasoning that states go to war because of a clash of policies and not because of weapons). "Weapons do not have a moral say, one way or the other." *Id*.

127. U.N. Charter art. 51.

128. *See* Lambakis, *Putting Military Uses of Space in Context*, *supra* note 117, at 23.

alleviate the instability perceived by the United States in an attempt to prevent Americans from resorting to the use of the self-defense argument? If the arms control community has any hopes of creating a safer space environment for the next century, the current legal regime must evolve by developing and implementing alternative means of addressing America's inviolable right to self-defense.

1. Application of Self-Defense in Outer Space: The Issue of Protective Jurisdiction

> The ability of the United States' military to operate in space is unquestionably seen as vital to the nation's security. In fact, in the National Defense Authorization Act for Fiscal Year 2000, the Congress asked the Department of Defense to "identify the technologies and technology demonstrations needed . . . to take full advantage of use of space for national security purposes."[129] According to U.S. Space Command, this is likely to entail increased military use of civil, commercial, and international space systems.[130]

The implication here is that defending U.S. space assets directly impacts U.S. national security.

The concept of defending military space assets is not unprecedented, evidenced by the amount of money spent by the United States in the research and development of "defensive" space weapons.[131] However, the increasing commercialization of space has broadened the scope of the concept of self-defense to include not only threats against a nation's people, but also threats against a nation's property.

To demonstrate the extent that outer space has been commercialized in recent years, one need not look further than

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129. National Defense Authorization Act for Fiscal Year 2000, Pub. L. No. 106–65, § 1601, 113 Stat. 512 (1999).

130. Christopher M. Petras, *The Use of Force in Response to Cyber-Attack on Commercial Space Systems—Reexamining "Self-Defense" in Outer Space in Light of the Convergence of U.S. Military and Commercial Space Activities*, 67 J. AIR L. & COM. 1213, 1265 (2002) (footnotes added); *see also* U.S. SPACE COMMAND, VISION FOR 2020, at 7 (1997).

131. *See supra* note 130.

the fact that in 1996 the annual number of commercial space launches surpassed the number of government launches for the first time in history.[132] According to some reports, the current commercial and scientific activities in space include some 1,100 companies and approximately fifty-three countries using space for many communication and financial transactions, totaling an annual business of $81 billion.[133] Moreover, with the recent winning of the Ansari X prize, a commercial space flight system and the prospect of placing ordinary citizens in space are just around the corner.[134]

America's deep-seated fears about the vulnerability of its space assets[135] are rooted in the fact that the United States is more dependent on space technology for its security and economic well-being than any other nation.[136] Consequently, as the enemies of the United States become more technically proficient in space operations, U.S. military policymakers are driven to protect space assets they believe to be a "soft underbelly" ripe for attack.[137] However, it is not just U.S. space assets that policymakers are seeking to protect. The reality is that America's critical infrastructure, encompassing the telecommunications, banking and finance, energy, transportation, and essential government services, has become increasingly vulnerable to precision missile attacks.[138] Although

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132. *See* REPORT OF THE NATIONAL DEFENSE PANEL, TRANSFORMING DEFENSE: NATIONAL SECURITY IN THE 21ST CENTURY 38, 38 (1997), *available at* http://www.dtic.mil/ndp/FullDoc2.pdf. The Panel also "noted that more than 1,000 satellites were expected to be launched in the decade between 1997 and 2006, representing a total investment of more than half-trillion dollars." *Id.*

133. *See* Press Release, The Institute for Cooperation in Space (ICIS) Sen. Roche on Canada Leading International Ban on Space-based Weapons (June 13, 2002), http://www.peaceinspace.com/pb_pressrel02.shtml.

134. *See* Michael Coren, *Commercial Space Travel Next Leap For Mankind?*, CNN, June 20, 2004, http://www.cnn.com/2004/TECH/space/06/18/ssone.flight.history.

135. *See* Johnson, *Space Security: Options and Approaches*, *supra* note 81.

136. *See* Rumsfeld Commission, *supra* note 88, at 18.

137. *See* Theresa Hitchens, Vice President, Center for Defense Information, *Making Progress: Opportunities for Improving Space Security*, Pugwash Workshop on Preserving the Non-Weaponization of Space, (May 2003), *available at* http://www.pugwash.org/reports/sc/may2003/space2003-hitchens.htm.

138. *See* Jack Spencer & James J. Carafano, *The Use of Directed-Energy Weapons to Protect Critical Infrastructure*, THE HERITAGE FOUNDATION, Aug. 2, 2004, *available at*

guided missile technology may have been available for years, the emergence of global terror networks and sophisticated smuggling techniques since 9/11 have made the threat of precision missile attacks more likely.[139] With the ever-increasing vulnerability of its space assets and its critical infrastructure, it is understandable why U.S. space hawks are wary of relying simply on legislation and international agreements over essential means of self-defense.[140]

In light of these current facts and future prospects, it is also understandable why current U.S. policy provides for deterring and, if necessary, defending against purposeful interference with U.S. space systems using "all appropriate self-defense measures, including . . . the use of force."[141] More specifically, the Department of Defense clarified the issue by asserting in its 1999 National Space Policy that U.S. space systems are national property afforded the right of passage through and operations in space without interference, in accordance with [National Space Policy (1996)]. Purposeful interference with U.S. space systems will be viewed as an infringement on our sovereign rights.[142] Thus, the United States has made it clear that the "inherent right of self-defense" allows the use of military force, not just in response to attacks on the nation's military space systems, but also in response to attacks against U.S. commercial interests and investments in space as well.[143]

2. Is the U.S. Threat Assessment Exaggerated?

The question of whether the U.S. threat assessment is exaggerated is open to debate. Some members of the arms control community argue that an attack on space assets, military or commercial, is very difficult and not likely to be the target of terrorist actions, especially when a terrestrial target

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http://www.heritage.org/Research/NationalSecurity/bg1783.cfm.

139. *Id.*

140. *Id.*

141. Current Department of Defense policy states that civil and commercial space capabilities are to be used "to the maximum extent feasible and practical." DEP'T OF DEF., DIRECTIVE NO. 3100.10, SPACE POLICY 8 ¶ 4 (1999).

142. *Id.* at 6 ¶¶ 4.1–4.2.1.

143. *Id.*

such as a launch facility would provide a more feasible option.[144] Such space doves often put forth the argument that the security of U.S. space assets has a greater chance of being enhanced by making the satellites less vulnerable to attack and less valuable rather than by creating and implementing space weapons.[145] The primary forms of achieving such a goal with satellites are satellite hardening and satellite miniaturization.[146] Hardening a satellite makes destroying it more difficult. Satellite miniaturization reduces existing vulnerabilities by increasing the number of satellite systems, thus making them more distributed and redundant.[147] The end goal of each method is to reduce the likelihood of attack on an individual satellite, not only by making it more difficult, but also by reducing the likelihood of widespread disruption should an individual satellite go down.[148] The added benefit of such a plan is that greater security can be achieved through tinkering with the satellite systems themselves rather than by creating a vast network of defensive weapons.

These arguments, however, do not adequately assuage the fears of U.S. space hawks. They are concerned about the potential for conflict in space arising from increased competition among the rapidly proliferating numbers of users and uses for the limited environment of space.[149] Even members of the international space industry who choose to stay out of the space weapon debate recognize the potential for trade wars in space and have called for better "rules of the road" to clarify issues such as how to allocate orbital slots and spectrum and how to

144. *See* Mueller, *supra* note 86.

145. *Id.*

146. *Id.*

147. S*ee generally* ROBERT B. GIFFEN, U.S. SPACE SYSTEM SURVIVABILITY: STRATEGIC ALTERNATIVES FOR THE 1990S, NATIONAL SECURITY AFFAIRS MONOGRAPH SERIES 82–84 (National Defense University Press 1982) (containing an early but detailed discussion of options for reducing satellite vulnerability).

148. *See* DAVID W. ZIEGLER, SAFE HEAVENS: MILITARY STRATEGY AND SPACE SANCTUARY THOUGHT 30 (Air University Press 1998) (1996); s*ee also* Mueller, *supra* note 86 (likening the redundancy of satellites to the U.S. interstate highway system: "economically vital to the nation, but hardly worth the trouble of attacking because its resilience and redundancy means that none of its individual components is critical").

149. *See* Hitchens, *Rushing to Weaponize the Final Frontier*, *supra* note 80.

properly assign collision liability.[150]

Moreover, the current legal regime for space fosters legitimate concerns of insecurity. In light of the ineffectiveness of the regime, it is no wonder why space hawks argue that arms control and disarmament measures should be considered merely as tools to enhance security rather than as ends in and of themselves.[151] Until an arms controller can provide documented evidence that a ballistic missile traveling through space can be stopped in its tracks, space hawks will continue to consider irrelevant any argument that the U.S. threat assessment is exaggerated. In other words, the fear driving space hawks is generated from the belief that the United States lacks effective military means of protecting itself against viable threats to its assets.[152]

Unless something radical takes place, space weaponizers will simply hide behind the broad cloak of self-defense. Consequently, any enhancement to the legal regime must incorporate substantial tools to address these growing security concerns of the United States. Whether or not that means allowing a certain degree of space weaponization greatly enhancing the verification and monitoring of the legal instruments, something needs to be done, and soon.

C. Can Space Weaponization Provide Stability and Control?

The final, major justification for space weaponization is a spin-off of the first two arguments in that it is predicated on the inability of the arms control approach to provide national security and international stability.[153] However, unlike the inevitability or the vulnerability arguments, the control argument justification for space weaponization is also motivated by an American desire to maintain its space hegemony, with international stability as the natural by-product.[154]

Instead of being a reactionary measure to the circumstances

150. *Id.*

151. *Id.*

152. *See* Moltz, *supra* note 8.

153. *See* Johnson, *Space Security: Options and Approaches*, *supra* note 81.

154. *See id.*

and actions of other state and nonstate actors, the United States' control argument for space weaponization asserts that a proactive effort by its military is necessary to assure stability and security. The reason a proactive effort is needed is because the utility of the arms control approach has dissipated as the international system has moved into a scenario in which nonstate actors play an increasingly visible role.[155] This debate has boiled down to a difference in ideologies and interpretations of history, but progress can be achieved by refocusing on U.S. interests in the form of enhancements to the current legal regime.

1. The Quest for Space Dominance

Many feel the United States has the most to lose by weaponizing space because of its reliance on space assets.[156] Others believe, for the same reasons, that the United States actually has the most to gain.[157] As the most powerful military nation in the world, many U.S. advocates of space weaponization seek to extend America's military hegemony into space.[158] To counter this argument, arms controllers contend that any degree of hegemony achieved would be short-lived because "effective defensive weapon systems will inevitably be countered by effective offensive systems."[159] This will spark a spiraling arms race that will ultimately level the playing field and leave all sides less secure.[160] On the other hand, many space weaponizers believe that the first state to deploy space weapons will have an insurmountable advantage over its rivals.[161]

The Rumsfeld Commission made it quite clear that the best way to secure U.S. interests is to transition from space superiority to space dominance.[162] Yet, U.S. space warriors

155. *Id.*

156. *See* Mueller, *supra* note 86.

157. *See* Lambakis, *Putting Military Uses of Space in Context*, *supra* note 117.

158. *See* Johnson, *Space Security: Options and Approaches*, *supra* note 81.

159. *See* Graham, *International Law and the Military Uses of Space*, *supra* note 73.

160. *See* Graham, Future of International Cooperation in Space, *supra* note 46.

161. *See* Mueller, *supra* note 87. *See generally* EVERETT C. DOLMAN, ASTROPOLITIK: CLASSICAL GEOPOLITICS IN THE SPACE AGE (2001).

162. *See* Rumsfeld Commission, *supra* note 88.

assure other nations that the quest for space dominance is motivated by a desire to promote international stability in space rather than by a desire to take over the world.[163] In all fairness, Washington currently has the power to tyrannize other nations with its unparalleled nuclear and conventional military forces, yet it does not.[164] Moreover, the face of overwhelming American military power has neither alarmed allies nor incited aggression.[165]

The direct benefits to the United States of implementing space weapons are clear. Not only can space weapons be the primary tool for information warfare, they can also provide an increased capability for stopping "potential aggressors more effectively, with less collateral damage, compared to conventional arms."[166] However, the United States also stands to gain indirect benefits from achieving space dominance. It is possible that U.S. efforts to achieve space weaponization primacy would prevent an arms race in space before it ever starts by establishing "a globally dominant, stabilizing force in space."[167] Also, a space-based weapons system could be the basis of a stabilizing cooperative security regime in outer space that abides by agreed upon rules of the road.[168]

The fact of the matter is that the world has not fallen apart after sixty years of increasing military activity in space.[169] The evolution of the militarization of space has been particularly shaped by pressing national security requirements of the United States, and as many space hawks firmly believe, "this is how it will continue to be."[170] The U.S. quest for space dominance may arguably serve to further selfish military desires, but it can also

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163. *See* Steven Lambakis, *Space Weapons: Refuting the Critics*, 105 POLICY REVIEW ¶ 38, Feb.-Mar. 2001, *available at* http://www.policyreview.org/feb01/lambakis_print.html.

164. *Id.*

165. *Id.*

166. *Id.*

167. *See* Marshall, *supra* note 59, at 20.

168. *Id.*

169. *See* Lambakis, *Putting Military Uses of Space in Context*, *supra* note 117, at 24.

170. *Id.*

provide a degree of stability that the current legal regime has been unable to provide.[171]

2. Cost/Benefit Analysis of Space Weaponization

The international community has failed to demonstrate how an enhanced legal regime for space can provide greater stability than space weaponization. In order to counter the control argument of the United States, the international community must continue to focus on how the economic, political, and unintended security ramifications of space weaponization outweigh the benefits.

First and foremost, the international community must stress that orbital space weapons arguably provide only marginal advantages when comparing military missions with space weapons and without them.[172] This point is only accentuated by the fact that the United States also has the dominant power projection capabilities from its armed forces.[173] Other costs that must be factored into the process of space weaponization include the costs of developing, constructing, implementing, and operating what would be an outrageously expensive space weapons system.[174] Just as important as these monetary costs, which would require either the creation of new funds or the reassignment of nondefense money, are the inevitable political costs that accompany being the first nation to weaponize space, like being labeled "power hungry."[175]

Next, the international community must do a better job of communicating not only the ease with which hostile actors would be able to disable even the most sophisticated of the Pentagon's defenses, but also the greater utility of international agreements, which would create effective deterrents.[176] A common and simple method of disabling this type of space weapon system would be to jam its signals remotely, using

171. *Id.*
172. *See* Mueller, *supra* note 86.
173. *Id.*
174. *Id.*
175. *Id.*
176. *See id.*

electronic means.[177] Hostile actors could also create countermeasures to cause equally destructive results by deploying launch instruments or satellites that disperse sand or gravel into low-Earth orbit. This would destroy any satellite in space by creating high speed collisions.[178]

Quite possibly the most important cost of space weaponization, in terms of its geostrategic impact and the threat most important to communicate, is that space-based weapons do not simply enhance existing threats, they also introduce a new and greater danger because of the threat they pose to strategic stability.[179] The vulnerability of space-based weapons will likely create incentives for other states and nonstate actors to develop space weapons, most obviously because they lack the conventional military and force projection abilities in comparison with the United States.[180] Once again, the unfortunate end result could easily be a destabilizing arms race making the world less safe and more prone to war.[181]

3. Partial Space Weaponization

If a middle ground is not reached between the Bush Administration and the arms control community, the likely result will be no agreement whatsoever, which would be to the ultimate detriment of both sides.[182] Based on this belief James Clay Moltz has famously proposed a middle ground for space hawks and doves to meet.[183] In addition to limited missile defense, Moltz proposes that nations be granted permission to attack missiles traveling through space, which would include the deployment of boost-phase missile defenses that do not

177. *See* Moltz, *supra* note 8.

178. *Id.*

179. *See* Tannenwald, *supra* note 16, at 399.

180. "Although supporters of space weapons claim such weapons would be for defensive purposes, the reality is that, given their characteristics, many of them are inherently offensive weapons." *Id.* "It is widely recognized that space-based ballistic missile defense systems could carry out surprise attacks against terrestrial targets or satellites." *Id.* at 399–400.

181. *See* Moltz, *supra* note 8.

182. *Id.*

183. *See id.*

require space-based components.[184] Here's the catch for space hawks: in his proposal, a ban is placed on

> the use, testing, or deployment of weapons or interceptors, of any sort, above five hundred miles; a ban on stationing weapons, of any sort, in low-Earth orbit; a ban on the testing or use of lasers from ground, sea, or air-based orbital objects; and a ban on testing or use of other ground, sea, or air-based weapons against satellites or space-based objects.[185]

The obvious benefit of this strategy is that it would garner the support of American moderates in general, but more importantly, those moderates in the Pentagon who disagree with the hard-line stance of the space hawks on weaponization. Just as important, this strategy would most likely receive bipartisan consensus in Congress, especially gaining support from moderates who are deathly afraid of being painted as "anti-missile defense."[186] At the international level, a partial weaponization strategy offers the Chinese and Russians an avenue to limit some of the most threatening elements of missile defense.[187]

Currently, however, this proposal is absolutely unacceptable to those who will settle for nothing less than a complete ban on weapons in space.[188] What might temper the sentiments of vehement space doves is a brief comparison of the issue of space weaponization to the debate arising prior to the emergence of nuclear weapons. For all the efforts by the international community to impose a complete ban on nuclear weapons, the movement slowly evolved toward efforts to simply tame these weapons.[189] In fact, space hawks find it particularly encouraging

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184. *Id.* Although, according to the proposal, the testing of certain interceptors against ballistic missiles passing through space would be allowed with certain restrictions. *Id.*

185. *Id.* This set of prohibitions is designed to protect communication satellites in geostationary orbit and mediate use of low-Earth orbit. *See id.*

186. *See id.*

187. *See id.*

188. *See id.*

189. Jonathan Dean, *Defenses in Space: Treaty Issues*, OCCASIONAL PAPER 10, *in* FUTURE SECURITY IN SPACE: COMMERCIAL, MILITARY, AND ARMS CONTROL TRADE-OFFS, CTR. FOR NONPROLIFERATION STUDIES 3, 7 (James C. Moltz, ed., 2002), *available at*

that current efforts to control space weapons are occurring "earlier in the cycle and [consequently] space weaponization may emerge more slowly with a longer interval before the first use of these devices as weapons than was the time between Trinity and Hiroshima."[190] In other words, with more time between the deployment of space weapons and their first use, the efforts of human society will eventually learn the best way to control them.[191]

The fundamental divide between the two sides revolves around the question of whether greater security can be attained by preventing the weaponization of space at the cost of accepting a level of uncertainty for the future, or on the other hand, by furthering weaponization efforts at the risk of promoting an arms race and armed conflict. Unfortunately, there has been very little progress towards achieving a semblance of an answer to the question. The logistics of Moltz's proposal may not be as important as the principle of compromise that he has infused into the space weaponization debate. Partial space weaponization may or may not be the answer, but it at least recognizes that the goal should be achieving greater security than what we have today rather than continuing to strive for total security. Although it may not be the only way, international cooperation in the form of a comprehensive, international legal regime with teeth has a greater likelihood of avoiding a new frontier that will always be vulnerable to the uncertainties and fluctuations of technology development and political instability.

IV. INCREMENTAL, PRACTICAL STEPS AND THE SPIRIT OF COMPROMISE ARE NECESSARY TO ENHANCE THE CURRENT LEGAL REGIME BEYOND A STRICTLY RULE-BASED REGIME FOR THE SAKE OF SPACE SECURITY

The world is dangerously close to the brink of space weaponization. Current efforts to stabilize and strengthen the legal regime for outer space have been fruitless. Unless a

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http://cns.miis.edu/pubs/opapers/op10/op10.pdf.

190. *Id.*

191. *See id.*

different approach is taken, each side will only become more entrenched, and space security will suffer dramatically. The focus of this section of the Article is to impress upon the proponents and opponents of space weaponization the importance of communication and compromise and to identify incremental, practical steps to enhance the current legal regime for the sake of progress and inevitably, and for the sake of space security.

A. A New Forum of Discussion

The debate on space weaponization at the international level has turned into a "dialogue of the deaf" between Washington and foreign capitals. It also resulted in total gridlock at the Conference for Disarmament due to China's opposition to U.S. views on space weapons.[192] It does not help that the United States has firmly stated that it is willing only to discuss, not negotiate, any agreement banning weapons from outer space.[193]

Similarly, the United States' COPUOS has proven to be ineffective primarily because of instances, such as the one in November 2000, when the United States was one of three countries[194] to refuse to vote for a U.N. resolution citing the need for steps to prevent the arming of space.[195] In response to the suggestion of a new forum for outer space arms control efforts, Mr. Eric Javits of the U.S. State Department replied, "Changing venues would not change national positions. States would still have the same concerns that they have in existing fora."[196]

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192. *See* Moltz, *supra* note 8.

193. *See* Grahame, *A Question of Intent*: *Missile Defense and the Weaponization of Space*, *supra* note 1; *see also* John R. Bolton, U.S. Under Sec'y of State for Arms Control and International Security, Statement to the Conference on Disarmament (CD), Geneva (Jan. 24, 2002) (expressing to the CD that the current international regime regulating the use of space fulfills all of America's purposes).

194. *See* Theresa Hitchens, CDI Vice President, Presentation to the Ballistic Missile Defense (Apr. 18, 2005), Weapons in Space: Silver Bullet or Russian Roulette?: The Policy Implications of U.S. Pursuit of Space-Based Weapons, *available at* http://www.cdi.org/missile-defense/spaceweapons.cfm. The other two countries were Israel and Micronesia. *Id.*

195. *See id.*

196. Press Release, United States Mission—Geneva, Remarks by Ambassador Eric M. Javits to the Conference on Future Security in Space (May 29, 2002),

If negotiation of a comprehensive legally binding space weapons agreement is too much for the United States as an initial step in the face of security concerns, then consideration should be given to a more cautious approach. An example of this consideration is establishing a discussion forum starting with either a variant of a U.N. subcommittee or perhaps a convocation of space-faring nations such as the G8 (somehow incorporating China). In so doing, this forum should address in detail the prospect of promoting "no first deployment pledges" and establishing transparency and other confidence building measures. The important goal is bringing the United States to the table.

Further, another option that should be considered would be the creation of a new forum that would bring together not only diplomats, but also academicians, military officers, and industry representatives to discuss all issues related to space security. Currently, however,

> various aspects of space asset management are discussed in widely different fora with little crossover in participation. Given that space security involves commercial, military, scientific, and political aspects, it might be worthwhile to consider how to ensure that space security efforts in the different realms are coordinated. [While] the answer may simply be to reinvigorate the U.N. Office of Outer Space Affairs,[197]

the international community should consider the creation of a new and voluntary annual gathering of all space stakeholders.[198] The bottom line is that a change in the forum may place additional, unified pressure on the United States to change its position, but it will not create effective change unless the United States has a legitimate incentive to participate.

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http://geneva.usmission.gov/press2002/0529javitssecurityinspace.html.

197. Hitchens, *Making Progress: Opportunities for Improving Space Security*, *supra* note 137.

198. *See id.*

B. Strengthening the OST

Practically speaking, the most efficient way to strengthen the current regime is to build on the OST.[199] Of course, the first action must be to fill the definitional gaps that have plagued the OST for decades (discussed in subpart II.C). This process may take a while, but unless this definitional ambiguity is put to an end, advocates and foes will have that much more of a difficult time communicating with each other in the future than they already do. Whether it is via an additional protocol to the OST or simply via an amendment, building off the OST would not require the lengthy negotiations of drafting a new treaty.[200]

According to John Rhinelander and Philip Coyle, a unanimously endorsed amendment to the OST by its members would generate a great deal of valuable momentum.[201] However, this strategy would first require that the States Parties to the OST convene a meeting.[202] The obvious danger in this strategy is the risk of angering the Bush Administration by summoning the United States to the negotiating table. It could not only block the adoption of any protocol, but more importantly, could declare the OST an outdated encumbrance just like it did with the ABM Treaty.[203] To the Bush Administration, the OST needs no change because it is an adequate multilateral arms control regime that protects states' interests in outer space.[204] Since the OST is still

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199. *See* Rebecca Johnson, *NGO Approaches and Initiatives for Addressing Space Security*, OCCASIONAL PAPER 10, in FUTURE SECURITY IN SPACE: COMMERCIAL, MILITARY, AND ARMS CONTROL TRADE-OFFS, CTR. FOR NONPROLIFERATION STUDIES 66–67 (James C. Moltz, ed., 2002), *available at* http://www.acronym.org.uk/textonly/space/miis.htm.

200. *See* Robert E. White, *Preserving Space for Peaceful Use: A Case for A New Space Treaty*, ch. 3(2) (Centre for Peace Studies, Working Paper No. 10 2001).

201. *See* Philip E. Coyle & John B. Rhinelander, *Drawing the Line: the Path to Controlling Weapons in Space*, 66 DISARMAMENT DIPLOMACY ¶ 27, 2002, *available at* http://www.acronym.org.uk/dd/dd66/66op1.htm.

202. *See* Johnson, *NGO Approaches and Initiatives for Addressing Space Security*, *supra* note 199, at 66.

203. *Id*.

204. *See* Remarks by Ambassador Eric M. Javits, *supra* note 196. According to Mr. Javits, "there already exists an extensive and comprehensive regime for limiting the uses of outer space to those that are peaceful and providing a framework for the legitimate military uses of outer space." *Id.*

useful at the very least for its prohibition of WMDs in space, all plans by the arms control community to proffer amendments to the OST must be considered very carefully for it may lead to the unintended consequence of weakening the U.S. commitment to the existing treaty provisions.[205]

That said, although it has its shortcomings, the OST has, for the most part, withstood the duration of time, and for that exact reason, an effort to strengthen it must be pursued.

C. Confidence Building: Transparency and Monitoring Space Security Policy

Strengthening the monitoring and verification mechanisms of the legal regime is one of the most effective means of building its credibility.[206] Increasing transparency and monitoring the verification of compliance measures also provides the necessary confidence among parties to a legal regime that negotiated obligations are being fulfilled and, therefore, that real security benefits will be realized. Needles to say, without these broadly agreed upon compliance and verification mechanisms and measures, the analysis and resolution of future crises will only become that much more difficult.[207]

A further measure of stability is introduced if these measures are refined to the point that both sides understand what conditions would justify the system's use for self-defense. Also, through an effective monitoring system, a nation could gain assurance that others are not undertaking secret deployments, giving them a sense of security that may mitigate the impulse to take defensive and potentially escalatory

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205. Johnson, *NGO Approaches and Initiatives for Addressing Space Security*, *supra* note 199, ¶ 33.

206. *See* Remarks by Ambassador Eric M. Javits, *supra* note 196.

207. Letter Submitted by the Canadian Delegation to the United Nations (Oct. 23, 2003), http://www.dfait-maeci.gc.ca/arms/intervene2-en.asp. "While a presumption of good faith on the part of those entering into binding commitments remains at the core of international security cooperation, effective verification also remains a critical element of the security cooperation equation, as part of a robust and meaningful multilateralism." *Id.*; *see also* Detlev Wolter, *Lessons from Control Regimes: Common Security in Outer Space and International Law*, 21 INTERNATIONAL NETWORK OF ENGINEERS AND SCIENTISTS AGAINST PROLIFERATION ¶ 8, Apr. 2003, *available at* http://www.inesap.org/bulletin21/bul21art28.htm.

measures.[208]

The maintenance of effective verification measures "including exchange of information, transparency, inspection, and shared observations about the technology and future directions of reconnaissance from space"[209] will most certainly be vital to the success of any efforts to improve the current legal regime. For instance,

> [a]t present, satellite imagery is regularly used to track activities that could reveal programmes to develop [WMD] in countries of concern around the world. These are crucial efforts that we must never allow to be disrupted, especially not with relatively simplistic weapons systems that could someday be deployed to counter military anti-satellite defense systems. [Furthermore,] [g]iven the relentless progression of technological development, [we must strive to ensure] that these monitoring and verification measures are protected [and can keep up with technological developments.][210]

Finally, the enhancement of space situational awareness—a term coined by the U.S. military to describe the monitoring and tracking objects in space—will also be critical "to building confidence among international military space bureaucracies."[211] Industry leaders are also deeply concerned about space situational awareness because of ever-present possibilities of major satellite collisions or interference.[212] Some have even suggested the possibility of seeking to establish an outer space peacekeeping agency whose mission would be to monitor outer space.[213] However, it may be more feasible to take baby steps by

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208. Conference Report, Safeguarding Space Security: Prevention of an Arms Race in Outer Space 8–10 (Mar. 2005), *available at* http://www.nuclearfiles.org/menu/key-issues/space-weapons/issues/F322B145.pdf.

209. Coyle & Rhinelander, *supra* note 201.

210. *See* Graham, *International Law and the Military Uses of Space*, *supra* note 73.

211. Hitchens, *Making Progress: Opportunities for Improving Space Security*, *supra* note 137. "One central concern in U.S. military space circles is that satellites once in orbit might be maneuvered out of their parking orbit and used as ASATs." *Id.*

212. *Id.*

213. *See* Carol Rosin & Alfred Webre, *How to Proceed with the Space Preservation Treaty*, 20 INTERNATIONAL NETWORK OF ENGINEERS AND SCIENTISTS AGAINST

seeking productive ways to cooperate in strengthening verification and compliance mechanisms within existing treaties and by ensuring that strong measures of this nature are included in newly negotiated instruments.[214]

V. CONCLUSION

Humankind has already reaped incredible commercial and scientific benefits from space, and the prospect of further benefits is evidenced by the rapid proliferation of commercial and military users of space. However, the shortcomings of the current legal regime of space threaten to derail the boundless potential space has to offer, which is problematic as the world has become increasingly reliant on these space assets.

The line in the sand has clearly been drawn in the debate over whether to weaponize space. On one side, the international community vehemently objects to any effort to weaponize space and has proactively sought to preserve the realm of space as a sanctuary to be used strictly for peaceful purposes. On the other side of the line, however, is the United States, seeking to assert its current role as the world's only superpower by pursuing a space weapons program. Unfortunately for the international community, the United States has the technological and economic capabilities along with the political will to pursue this type of program.

What gets lost in the space weaponization debate is the more urgent issue of how to strengthen today's ambiguous legal regime for space. The norms established by the current regime are being strained by the increasing demand for the advantages that space can provide and by the growing capability to achieve them. Naturally, the dividing line in the debate on how to enhance the legal regime for space is similar to chasm created by the polarizing effects of the weaponization debate with many in the international community advocating a rule-based regime,

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PROLIFERATION ¶ 2, June 10, 2002, *available at* http://www.inesap.org/bulletin20/bul20art17.htm. Once again, the concern here is that increasing the visibility of the OST would put it into the firing line of those who may want to get rid of it. *See* Johnson, *NGO Approaches and Initiatives for Addressing Space Security*, *supra* note 199, at 66–67.

214. *See* Letter Submitted by the Canadian Delegation to the United Nations, *supra* note 207.

and on the other end of the spectrum, the United States advocating a power-based regime. Regardless of the United States' ultimate motivation for space weapons—whether it be for national security, commercial gain, or international stability—arms controllers have yet to address each of these concerns adequately. With the prospects for progress looking bleaker with each passing day, a new way of thinking is necessary if the current legal regime is to be enhanced. Not only must U.S. concerns and interests be adequately addressed, but a spirit of compromise, in the form of incremental steps, is necessary for the sake of future space security.

*Andrew T. Park**

* J.D. Candidate 2006, University of Houston Law Center; M.A., New York University; B.A., Columbia University. This Comment received the 2005 Strasburger & Price, L.L.P. Award for Outstanding Comment in International Law. The Author would like to extend his gratitude to the editorial board of HJIL for their hard work and dedication to this Comment. Finally, the Author would like to give special thanks to his wife and best friend MiWon C. Park for her unending love and encouragement.