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# Silent War: Applicability of the *Jus in Bello* to Military Space Operations

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CONTENTS



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*"While we may be uneasy about what lies ahead, we must be bold, imaginative and resourceful, aware of the promises as well as the perils of the unknown."* [1]

## I. INTRODUCTION

It could be said that every war in human history has its own signature sound. The pounding of marching boots—World War I. The unique "woo woo" noise of the Luftwaffe formations, or perhaps the deafening blast of the atomic bomb explosion—World War II. The whirl of helicopter blades—the Vietnam War. And so on. However, there are no molecules of air to carry sound waves in the vacuum of outer space. Therefore, it may well be that space warfare is the first type of war whose signature sound would be—silence.

But does the looming threat of a Silent War portend the need to revisit Cicero's dictum that *inter arma enim silent leges* ("in times of war, the law falls silent")?[2] While it is questionable whether that adage has ever been accurate,[3] it is manifestly untrue today, or at least insofar as terrestrial conflict is concerned.[4] Perhaps, however, the timeless silence of the cosmos forebodes a different conclusion when it comes to war in outer space.

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1. Kenneth B. Keating, *The Law and the Conquest of Space*, 25 JOURNAL OF AIR LAW AND COMMERCE 182, 192 (1958).

2. CICERO, PRO MILONE 16 (N.H. Watts trans., Harvard Univ. Press 5th ed. 1972) (52 B.C.).

3. *See*, *e.g.*, JOHN KEEGAN, WAR AND OUR WORLD 26 (2001) ("Even in the age of total warfare when, as in Cicero's day, war was considered a normal condition . . . there remained taboos, enshrined in law and thankfully widely observed.").

4. *See*, *e.g.*, GARY SOLIS, THE LAW OF ARMED CONFLICT 16 (2d ed. 2016) ("In time of war the laws are silent? Perhaps in Cicero's time, but not today. The many multinational treaties bearing on battlefield conduct and the protection of the victims of armed conflict demonstrate that there is a large and growing body of positive law, IHL, bearing on armed conflict."); HCJ 769/02 Public Committee against Torture in Israel v. Government of Israel 62(1) PD 507, ¶ 61 (2006) (Isr.), *reprinted in* 46 INTERNATIONAL LEGAL MATERIALS 373 ("The saying 'when the cannons roar, the muses are silent' is well known. A similar idea was expressed by Cicero, who said: 'during war, the laws are silent' (*silent enim legis inter arma*). Those sayings are regrettable. They reflect neither the existing law nor the desirable law . . . .").

We are now just over six decades into the "Space Age," which began in October 1957 with the launch of the Soviet satellite Sputnik.[5] In the succeeding sixty years, an all-out armed conflict in space has fortunately remained confined to the realm of science fiction. However, hopeful post-Sputnik predictions that "satellites would have no practical military application in the foreseeable future"[6] were rapidly disproven by advancements in science and technology.[7]

The 1991 Gulf War is sometimes dubbed the "First Space War," because of the extensive use by the United States of its satellite capabilities during that conflict.[8] Since then, the military potential, as well as the actual military uses of space assets, has steadily grown.[9] Over the past few decades, several State space powers have demonstrated their ability to conduct kinetic attacks against satellites in orbit,[10] sometimes with dramatic effects, as seen in the Chinese satellite intercept test in 2007.[11] More recently, speculation has arisen as to the potential of some States to engage in hostile on-orbit proximity

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5. The probable first use of the term can be traced back to a front-page headline in the London *Daily Express* the day after Sputnik was launched. *Space Age Is Here*, DAILY EXPRESS (London), Oct. 5, 1957, at 1.

6. William J. Jorden, *Soviet Fires Earth Satellite into Space*, NEW YORK TIMES, Oct. 5, 1957, at 1.

7. *See*, *e.g.*, National Security Council Planning Board, *U.S. Policy on Outer Space* ¶¶ 15 and 19 (June 20, 1958), http://marshall.wpengine.com/wp-content/uploads/2013/09/NSC-5814-Preliminary-U.S.-Policy-on-Outer-Space-18-Aug-1958.pdf ("Any use of outer space . . . may have some degree of military or other non-peaceful application. . . . The effective use of outer space by the United States and the Free World will enhance their military capability."); Central Intelligence Agency, *US Military Space Activities* ¶ 3 (United States Delegation to the U.N. Committee on the Peaceful Uses of Outer Space, Position Paper, Mar. 14, 1962), https://www.cia.gov/library/readingroom/docs/CIA-RDP66R00638R00 0100150082-7.pdf [hereinafter U.S. Military Space Activities]

> The US is engaged in a broadly-based outer space effort . . . . In conducting this effort we are drawing on the resources of our defense agencies as well as those of our civilian space agency. As far as we know, the Soviet space program also draws on military support.

8. Peter Anson & Dennis Cummings, *The First Space War: The Contribution of Satellites to the Gulf War*, 136 THE RUSI JOURNAL 45 (1991).

9. *See*, *e.g.*, JAMES CLAY MOLTZ, CROWDED ORBITS: CONFLICT AND COOPERATION IN SPACE 121–46 (2014).

10. DAVID WRIGHT, LAURA GREGO & LISBETH GRONLUND, THE PHYSICS OF SPACE SECURITY: A REFERENCE MANUAL 135–38 (2005).

11. *China Confirms Satellite Downed*, BBC NEWS (Jan. 23, 2007), http://news.bbc.co.uk/1/hi/world/asia-pacific/6289519.stm.

operations.[12] Outer space has become essential to modern warfare and the military forces of all major powers now rely on space assets to fulfil their functions.[13]

All these developments underline the urgency of understanding the extent to which the existing law of armed conflict—the *jus in bello*—applies to military space operations. This is certainly not just a matter of academic curiosity. As Richard Baxter, a leading twentieth-century U.S. international law expert, warned, "[t]he first line of defense against [the *jus in bello*] is to deny that it applies at all."[14] Similarly, George Aldrich, his contemporary, observed that when States refuse to apply the Geneva Conventions, they often justify such refusals by the "differences between the conflicts presently encountered and those for which the conventions were supposedly adopted."[15] In order to foster compliance with the law, we must therefore understand its remit, including in situations unforeseen by its creators.

Serious doubts have been raised in the relevant literature as to the applicability of the *jus in bello* to military operations in space. It has been suggested that the uniqueness of the space environment means that "it cannot be held beforehand that the corpus of the [*jus in bello*] applies *in toto* to armed conflict in outer void space."[16] Moreover, scholars have argued that *customary* principles of this body of law "are probably neither sufficiently specific nor entirely appropriate for military action in outer space,"[17] and that, conversely,

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12. *See, e.g.*, Subrata Ghoshroy, *The X-37B: Backdoor weaponization of space?*, 71 BULLETIN OF THE ATOMIC SCIENTISTS 19, 22 (2015) (suggesting the U.S. spaceplane X-37B may be capable of "making a rendezvous with another craft" and of doing "in-orbit maneuvers to spy on other satellites"); Laurence Peter, *Russia Shrugs Off US Anxiety over Military Satellite*, BBC NEWS (Oct. 20, 2015), http://www.bbc.co.uk/news/world-europe-34581089 (reporting an incident in which a Russian military satellite moved to within ten kilometers of an Intelsat satellite).

13. MOLTZ, *supra* note 9, at 172–173.

14. Richard Baxter, *Some Existing Problems in Humanitarian Law*, *in* THE CONCEPT OF INTERNATIONAL ARMED CONFLICT: FURTHER OUTLOOK 1–2 (Claude Pilloud ed., 1974).

15. George Aldrich, *Human Rights and Armed Conflict: Conflicting Views*, 67 AMERICAN SOCIETY OF INTERNATIONAL LAW PROCEEDINGS 141, 142 (1973).

16. Arjen Vermeer, *The Laws of War in Outer Space: Some Legal Implications for the* Jus ad Bellum *and the* Jus in Bello *of the Militarisation and Weaponisation of Outer Space*, *in* THE NEW ORDER OF WAR 69, 74 (Bob Brecher ed., 2010).

17. Steven Freeland, *The Laws of War in Outer Space*, *in* HANDBOOK OF SPACE SECURITY 81, 102 (Kai-Uwe Schrogl, Peter L. Hays, Jana Robinson, Denis Moura & Christina Giannopapa eds., 2015).

"it is at least arguable that no *conventional* international law regulates [military] activities" in outer space.[18]

This article addresses the uncertainty at the heart of this issue in a comprehensive and systematic way. At the outset, it lays down the conceptual framework for this inquiry by examining the factual notion of "military space operations," their relationship with the legal concept of "armed conflict," and the overall scope of the potentially applicable bodies of law (Part II). It then explores whether there are any general reasons that would preclude the applicability of the *jus in bello* to military space operations (Part III). These reasons are the *Lotus* objection, that is, the claim that without a specific rule extending the *jus in bello* to space, States remain unconstrained in their military activities (III.A.); the peaceful purposes objection that outer space, as a domain reserved for peaceful exploration, is beyond the reach of the law that governs armed conflict (III.B.), and the source-specific challenges posed by international treaties and customary international law (III.C.). Finally, Part IV considers the four specific dimensions of applicability of the *jus in bello*—material, personal, temporal, and geographic. It thus examines situations involving military space operations in which the law may apply (IV.A.); which persons are covered by its provisions, with a special focus on the status of military astronauts (IV.B.); what challenges are posed by the temporal specificities of some space operations (IV.C.), and whether the law should be seen as geographically constrained (IV.D.).

It should be noted that the focus on the threshold question of applicability has meant that a number of issues had to remain outside the scope of the present analysis. This is the case with regard to the follow-up question of how specific *jus in bello* rules apply to real or hypothetical space operations.[19] Similarly, there is no discussion of the practical application of space assets to further the goals of the *jus in bello* in a terrestrial context, such as

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18. William Boothby, *Does the Law of Targeting Meet Twenty-First-Century Needs*?, *in* CONTEMPORARY CHALLENGES TO THE LAWS OF WAR: ESSAYS IN HONOUR OF PROFESSOR PETER ROWE 216, 224 (Caroline Harvey, James Summers & Nigel D. White eds., 2014) (emphasis added).

19. To some extent, these questions are addressed by other contributions to this symposium. *See* Bill Boothby, *Space Weapons and the Law*, 93 INTERNATIONAL LAW STUDIES 179 (2017); Wolff Heintschel von Heinegg, *Neutrality and Outer Space*, 93 INTERNATIONAL LAW STUDIES 526 (2017); Dale Stephens, *The International Legal Implications of Military Space Operations: Examining the Interplay between International Humanitarian Law and the Outer Space Regime*, 94 INTERNATIONAL LAW STUDIES (forthcoming 2018).

documenting violations of the law[20] or supporting humanitarian action during armed conflict.[21]

## II. SPACE OPERATIONS AT THE INTERSECTION OF FACTS AND LAW

The scope of the present inquiry is shaped by factual as well as legal considerations. First, there is the factual question of the content of the eponymous term "military space operations." This concept (and its derivations) is defined in various ways in the literature,[22] and the line between military and non-military activities in outer space is notoriously blurry. As early as 1961, it was observed that "[v]irtually every activity in space has a possible military connotation; military and nonmilitary uses are extraordinarily interdependent."[23]

In this article, "military space operation" means any type of military action, including, but not limited to, acts of violence against the adversary,

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20. *See*, *e.g.*, Joshua Lyons, *Documenting Violations of International Humanitarian Law From Space: A Critical Review of Geospatial Analysis of Satellite Imagery During Armed Conflicts in Gaza (2009), Georgia (2008), and Sri Lanka (2009)*, 94 INTERNATIONAL REVIEW OF THE RED CROSS 739 (2012).

21. *See, e.g.*, Krystal Wilson, *Why Outer Space Matters: Krystal Wilson on Humanitarian Uses of Space*, INTERCROSS BLOG (Oct. 18, 2016), http://intercrossblog.icrc.org/blog/why-outer-space-matters-krystal-wilson-on-humanitarian-uses-of-space.

22. *See*, *e.g.*, JOHN J. KLEIN, SPACE WARFARE: STRATEGY, PRINCIPLES, AND POLICY 7 (2006) ("Military space activities are those promoting national security through offensive or defensive operations—whether from, into, or through space."); Chairman of the Joint Chiefs of Staff, JP 3-14, Space Operations, at II-1 (2013), http://www.dtic.mil/doctrine/new_pubs/jp3_14.pdf ("US military space operations are composed of the following mission areas: space situational awareness, space force enhancement, space support, space control, and space force application."); *Are We Losing the Space Race to China*, *Hearing Before the H. Subcomm. on Space of the H. Comm. on Sci., Space & Tech.*, 108th Cong. 46 (2016) (statement of Dean Cheng, Senior Research Fellow for Chinese Political and Security Affairs, The Heritage Foundation), https://www.hsdl.org/?view&did=796740, *citing* JIANG LIANJU, SPACE OPERATIONS TEACHING MATERIALS 126–54 (2013) ("PLA analysts believe that military space operations are likely to entail five broad styles (yangshi) or mission areas: space deterrence, space blockades, space strike operations, space defense operations, and provision of space information support.").

23. Leon Lipson & Nicholas de B. Katzenbach, *The Law of Outer Space*, *in* LEGAL PROBLEMS OF SPACE EXPLORATION: A SYMPOSIUM 806 (Legislative Reference Service, Library of Congress ed., 1961).

which have a material connection to outer space.[24] This space nexus may take at least four main forms:[25] (1) military operations *in* space, such as on-orbit proximity operations;[26] (2) military operations *from* space, such as (for the time being hypothetical) "orbital bombs," sometimes also referred to as "rods from God;"[27] (3) military operations *to* space, such as the launching of kinetic anti-satellite (ASAT) missiles;[28] and (4) military operations *through* space, such as the employment of long-range missiles that transit through outer space en route to their target.[29] The notion of material connection to space also covers the use of space assets necessary to support or enable military activities on earth.[30]

Second, there is the issue of the meeting of the facts and the law regarding the link between the factual phenomenon of military space operations and the legal notion of armed conflict. The existence of an armed conflict—or, more precisely, of either an international armed conflict (IAC) or a non-

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24. This definition is based on the conceptualization of "military operations," a term used throughout Additional Protocol I and elsewhere, as being broader than "attacks." *See*, *e.g.*, MICHAEL BOTHE, KARL JOSEF PARTSCH & WALDEMAR A. SOLF, NEW RULES FOR VICTIMS OF ARMED CONFLICTS: COMMENTARY ON THE TWO 1977 PROTOCOLS ADDITIONAL TO THE GENEVA CONVENTIONS OF 1949, at 408 (1982) ("'Military operations' as used in Protocol I involve both *fire* and *movement*. The thrust of the term 'attack' . . . deals with the fire aspect of the operation, not necessarily the movement part.") (emphasis in original).

25. For a similar classification of "space weapons," see Duncan Blake, *Military Strategic Use of Outer Space*, *in* NEW TECHNOLOGIES AND THE LAW OF ARMED CONFLICT 97, 108–11 (Hitoshi Nasu & Robert McLaughlin eds., 2014).

26. *See supra* text accompanying note 12.

27. *See*, *e.g.*, INDEPENDENT WORKING GROUP ON MISSILE DEFENSE, THE SPACE RELATIONSHIP, & THE TWENTY-FIRST CENTURY, 2009 REPORT, at 86 (2009), http://www.ifpa.org/pdf/IWG2009.pdf; *see also* WRIGHT, GREGO & GRONLUND, *supra* note 10, at 6–7 (arguing that the combination of relatively high cost and low reliability makes space assets poorly suited for kinetic attacks against ground targets).

28. *See*, *e.g.*, William J. Broad & David E. Sanger, *China Tests Anti-Satellite Weapon, Unnerving U.S.*, NEW YORK TIMES (Jan. 18, 2007), http://www.nytimes.com/2007/01/18/world/asia/18cnd-china.html (reporting on a Chinese ASAT weapons test); Thom Shanker, *Missile Strikes a Spy Satellite Falling from Its Orbit*, NEW YORK TIMES, Feb. 21, 2008, at A15 (reporting on a U.S. ASAT weapons test).

29. *See* John E. Shaw, *The Influence of Space Power upon History 1944–1998*, 46 AIR POWER HISTORY 20, 23 (1999) (noting that "the ICBM was the first weapon designed to travel into and through space").

30. *See, e.g.,* U.K. Parliamentary Office of Science and Technology, Military Uses of Outer Space, at 1 (Dec. 2006), http://www.parliament.uk/documents/post/postpn273.pdf (noting that space assets "are widely used to provide support for military or security related activities . . . [and] increasingly used to provide direct support for military operations").

international armed conflict (NIAC)—is a precondition for the applicability of the *jus in bello*.[31] Accordingly, a military space operation may either (1) occur within an existing armed conflict, or (2) be undertaken during peacetime, with different consequences for the interplay between the facts and the law.

If the former, the operation would *complement* or *augment* an existing state of hostilities, which might otherwise lack a material connection to space. In that case, the relevant legal question is whether the law of armed conflict applies to the military space operation just as it would to "ordinary" earth-based ("terrestrial") conduct. For instance, targeting of objects on the ground frequently relies on precision timing and navigation provided by satellites.[32] The question then is to what extent—if at all—the existing law regulates the space segment of the operation.[33]

By contrast, if an operation takes place in time of peace, the key question of law (for the purposes of this article) is whether that operation would by itself *trigger* the applicability of the *jus in bello*. For example, the near-future sci-fi novel *Ghost Fleet* foresees a high-power laser attack from a space station controlled by one State against the space assets of another State.[34] Would such a scenario bring about an IAC between the two States?[35]

Third, there is the purely legal question of the scope of the applicable law. The Latin term *jus in bello* is often translated into English as the law of war, which is, in turn, sometimes taken also to extend to matters concerning the law on the use of force.[36] However, I have refrained from analyzing questions of the *jus ad bellum*,[37] focusing solely on the *jus in bello*, which is under-

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31. Jann K. Kleffner, *Scope of Application of International Humanitarian Law*, *in* THE HANDBOOK OF INTERNATIONAL HUMANITARIAN LAW 43, 43–44 (Dieter Fleck ed., 3d ed. 2013).

32. *See*, *e.g.*, WRIGHT, GREGO & GRONLUND, *supra* note 10, at 165 (noting the use of the U.S.-developed Global Positioning System for guidance of precision munitions).

33. Answer: In principle, the space segment is governed by the *jus in bello* just as much as the ground segment. *See infra* Section IV.D.

34. PETER W. SINGER & AUGUST COLE, GHOST FLEET: A NOVEL OF THE NEXT WORLD WAR 44–47 (2015). The main text is intentionally vague to avoid any major spoilers.

35. Answer: Yes, it would. *See infra* Section IV.A.1.

36. *See*, *e.g.*, OFFICE OF THE GENERAL COUNSEL, U.S. DEPARTMENT OF DEFENSE, LAW OF WAR MANUAL § 1.3 (rev. ed., Dec. 2016) [hereinafter DOD MANUAL].

37. In doing so, the analysis observes the "cardinal principle that *jus in bello* applies in cases of armed conflict whether or not the inception of the conflict is lawful under *jus ad bellum*." Adam Roberts & Richard Guelff, *Introduction* to DOCUMENTS ON THE LAWS OF WAR 1 (Adam Roberts & Richard Guelff eds., 3d ed. 2000).

stood in simple terms as the law that "defines what is legal in armed conflicts."[38] It is also called international humanitarian law or the law of armed conflict, but for reasons of consistency *jus in bello* will be used throughout this article.[39]

The *jus in bello* contains hundreds, perhaps thousands, of conventional and customary rules. The central position among the long list of applicable treaties[40] belongs to the 1907 Hague Conventions (and particularly the so-called Hague Regulations annexed to the fourth Hague Convention[41]) and the 1949 Geneva Conventions,[42] together with their two Additional Protocols of 1977.[43] A compilation of applicable customary rules was published in 2005 by the International Committee of the Red Cross (ICRC),[44] which has maintained an updated version accessible as an online database.[45]

Although the focus of the discussion is on the *jus in bello*, the analysis would not be complete without consideration of the body of law that has been developed specifically for outer space, typically referred to as the law

38. Antoine Bouvier, *Assessing the Relationship between* Jus in Bello *and* Jus ad Bellum*: An "Orthodox" View*, 100 AMERICAN SOCIETY OF INTERNATIONAL LAW PROCEEDINGS 109, 110 (2006) (emphasis omitted).

39. *See also* Robert & Guelff, *supra* note 37, at 1–2 (discussing the various terms and their respective meaning).

40. *See Treaties, States Parties and Commentaries*, INTERNATIONAL COMMITTEE OF THE RED CROSS, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/.

41. Regulations Respecting the Laws and Customs of War on Land, annexed to Convention No. IV Respecting the Laws and Customs of War on Land, Oct. 18, 1907, 36 Stat. 2227, T.S. No. 539 [hereinafter 1907 Hague Regulations].

42. Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, Aug. 12, 1949, 75 U.N.T.S. 31 [hereinafter GC I]; Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, Aug. 12, 1949, 75 U.N.T.S. 85 [hereinafter GC II]; Geneva Convention Relative to the Treatment of Prisoners of War, Aug. 12, 1949, 75 U.N.T.S. 135 [hereinafter GC III]; Geneva Convention Relative to the Protection of Civilian Persons in Time of War, Aug. 12, 1949, 75 U.N.T.S. 287 [hereinafter GC IV].

43. Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts, June 8, 1977, 1125 U.N.T.S. 3 [hereinafter AP I]; Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts, June 8, 1977, 1125 U.N.T.S. 609 [hereinafter AP II].

44. 1 CUSTOMARY INTERNATIONAL HUMANITARIAN LAW (Jean-Marie Henckaerts & Louise Doswald-Beck eds., 2005) [hereinafter CIHL]. The ICRC published its results in two volumes: volume 1 (Rules) and volume 2 (Practice).

45. *See Customary IHL Database*, INTERNATIONAL COMMITTEE OF THE RED CROSS, https://ihl-databases.icrc.org/customary-ihl/eng/docs/home.

of outer space or simply space law. It consists primarily of five international agreements, with the 1967 Outer Space Treaty at its core.[46] Importantly, the existing framework of space law does not comprehensively address the issue of military uses of outer space.[47] The extent to which the rules of space law may affect the applicability of the *jus in bello* will be examined in this article; however, it does not dissect in detail the reverse issue of what effect the outbreak of hostilities may have on the peacetime law of outer space.[48]

## III. GENERAL OBJECTIONS TO THE APPLICABILITY OF THE *JUS IN BELLO*

### A. *Lotus Objection*

Although several States now possess significant military space capabilities, the development of the law has lagged behind. None of the provisions of the *jus in bello* apply specifically to conduct in outer space.[49] On the contrary,

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46. 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, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty]; Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue and Return Agreement]; Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187; Convention on Registration of Objects Launched into Outer Space, June 6, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15; Agreement governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 5, 1979, 1363 U.N.T.S. 3.

47. An ongoing project, the development of a Manual on International Law Applicable to Military Uses of Outer Space (MILAMOS), aims to respond to this need by developing a manual clarifying the fundamental rules applicable to such conduct in times of peace, as well as in armed conflict. *See McGill University Launches the Manual on International Law Applicable to Military Uses of Outer Space (MILAMOS®) Project*, MCGILL (May 27, 2016), www.mcgill.ca/milamos/files/milamos/mcgill_milamos_announcement_final_1.pdf. The present author is involved in the MILAMOS project as a core expert in the international humanitarian law research group.

48. *See* Steven Freeland & Ram Jakhu, *The Applicability of the United Nations Space Treaties during Armed Conflict*, *in* PROCEEDINGS OF THE INTERNATIONAL INSTITUTE OF SPACE LAW 157 (Rafael Moro-Aguilar, P. J. Blount & Tanja Masson-Zwaan eds., 2016).

49. A possible singular exception is Article II of the 1977 Environmental Modification Convention, according to which the term "environmental modification techniques" regulated by that treaty "refers to any technique for changing—through the deliberate manipulation of natural processes—the dynamics, composition or structure of the Earth, including

the relevant rules use a decidedly terrestrial vocabulary. For instance, Common Articles 2 and 3 of the Geneva Conventions, two provisions ordinarily seen as embodying the definitions of IAC and NIAC, respectively, contain express references to "the territory" of State Parties.[50] The fact that the 1907 Hague Regulations are limited in their scope to "war on land" is reflected in the title of that instrument.[51]

To some extent, this is unsurprising, as many *jus in bello* rules have a pedigree that significantly predates the Space Age.[52] And even the main post-1957 recodification effort, which resulted in the adoption of the 1977 Additional Protocols, took place at a time when extending the relevant rules to outer space was not a priority.[53] This neglect of outer space in the law of war had several likely causes. To a lesser degree, it was due to the fact that military space technology was then still in early stages of development and ground operations did not yet need to rely on space assets.[54] However, the probable

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its biota, lithosphere, hydrosphere and atmosphere, *or of outer space*." Convention on the Prohibition of Military or Any Hostile Use of Environmental Modification Techniques, May 18, 1977, 31 U.S.T. 333, 1108 U.N.T.S. 151 [hereinafter ENMOD] (emphasis added).

Stephens and Steer correctly note that this provision contains an "express recognition of the space environment." Dale Stephens & Cassandra Steer, *Conflicts in Space: International Humanitarian Law and its Application to Space Warfare*, 40 ANNALS OF AIR AND SPACE LAW 71, 80 (2015). However, the reach of the prohibitions contained in ENMOD is quite limited as far as conduct in outer space is concerned. The treaty only prohibits States from changing the outer space environment "through the deliberate manipulation of natural processes," which is not a feature of any known weapons programs. *See* ENMOD, *supra*, art. I; *see also* Robert A. Ramey, *Armed Conflict on the Final Frontier: The Law of War in Space*, 48 AIR FORCE LAW REVIEW 1, 57–58 (2000).

50. GC I, *supra* note 42, arts. 2, 3; GC II, *supra* note 42, arts. 2, 3; GC III, *supra* note 42, arts. 2, 3; GC IV, *supra* note 42, arts. 2, 3. *But see infra* text accompanying notes 192–2013 (analyzing these references in light of the geographical applicability of the *jus in bello*).

51. 1907 Hague Regulations, *supra* note 41.

52. *See*, *e.g.*, MICHAEL SHEEHAN, THE INTERNATIONAL POLITICS OF SPACE 96 (2007).

53. *Cf.* Boothby, *supra* note 18, at 224 n.38 (noting that "the explicit reference to outer space in Article II ENMOD," which was adopted before the Additional Protocols, meant that the drafters of the latter instruments "must have been at least aware of the prospect of military operations in outer space").

54. *See* CURTIS PEEBLES, HIGH FRONTIER: THE U.S. AIR FORCE AND THE MILITARY SPACE PROGRAM 73 (1997) (observing that until the 1980s, "many military leaders in all of the services still viewed the four primary defense support space missions as something outside the 'real world' of Air Force or Navy or Army operations" and that this attitude "changed perceptibly [during the First Gulf War] in 1991 when these pre-positioned assets in Earth orbit demonstrated forcefully the central role space support now played in military operations.").

principal reason was the geopolitical context of the Cold War, which was marked by States' strong reluctance to "deal with the military aspects of space activities" when drafting multilateral treaties.[55]

Although this absence of express "hard law" rules that would extend the applicability of the *jus in bello* to space activities is understandable, its importance should not be overstated. After all, international law is no longer[56]—if it ever was—based on a *Lotus*-like presumption that without express constraining rules, States are free to act as they please.[57] When States extend their activities to a new domain, that domain does not become a lawless zone.[58] Rather, generally applicable rules of international law will follow States' activities to their new locus. A number of relevant examples illustrates this point.

For an instance of a novel technology that postdated some of the crucially relevant law, consider the relationship between nuclear weapons and the *jus ad bellum*. The central international agreement governing the law on the use of force, the UN Charter, was drafted at a time when the invention of nuclear weapons was still a closely guarded secret.[59] Accordingly, the Charter did not refer to this type of weapon.[60] Nonetheless, the International Court of Justice (ICJ) had little difficulty in holding decades later that the

55. *See* Stephan Hobe, *Historical Background*, *in* 1 COLOGNE COMMENTARY ON SPACE LAW: OUTER SPACE TREATY 1, 14 (Stephan Hobe, Bernhard Schmidt-Tedd & Kai-Uwe Schrogl eds., 2009).

56. *See*, *e.g.*, Accordance with International Law of the Unilateral Declaration of Independence in Respect of Kosovo, Advisory Opinion, 2010 I.C.J. Rep. 404, 478–79, ¶¶ 2–3 (July 22) (Simma, J., declaration) (arguing that reliance on the *Lotus* principle "reflects an old, tired view of international law" and amounts to an "anachronistic, extremely consensualist vision of international law").

57. *Cf.* S.S. Lotus (Fr. v. Turk.), Judgment, 1927 P.C.I.J. (ser. A) No. 10, at 18 (Sept. 7) ("Restrictions on the independence of States cannot . . . be presumed").

58. *See also* Stephens & Steer, *supra* note 49, at 81 (arguing that a conclusion that "space is a lawless frontier" would additionally go "against the progressive thrust and reasoning underpinning the historic trajectory of IHL").

59. *Cf.* Legality of the Threat or Use of Nuclear Weapons Case, Verbatim Record CR 95/25, ¶ 46 (Nov. 3, 1995) (Oral Argument of Berchmans Soedarmanto Kadarisman) (noting that "the framers of the United Nations Charter could not be aware of the threat of nuclear weapons").

60. U.N. Charter arts. 2(4), 39–51.

Charter provisions "apply to *any* use of force, regardless of the weapons employed."[61] The fact that the existence of nuclear weapons was not known to the drafters of the Charter was irrelevant to the Court's conclusion.[62]

The growing importance of the Internet for virtually all types of human behavior and interaction offers another, more recent example. The novel environment of cyberspace has posed a similar challenge to the applicability of international law. In the 1990s, it was seriously argued that rules designed for the "offline world" did not and should not reach into cyberspace.[63] Perhaps the most colorful of such proclamations was the *Declaration of the Independence of Cyberspace*, authored by the libertarian activist John P. Barlow in 1996.[64] Yet, in less than two decades, States from all geographical regions of the world expressly affirmed that they considered international law to apply to conduct in cyberspace.[65] Moreover, this shared view was cemented by a

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61. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. Rep. 226, ¶ 39 (July 8) (emphasis added).

62. *See also* Stefan Kadelbach, *Interpretation of the Charter*, *in* THE CHARTER OF THE UNITED NATIONS: A COMMENTARY 79, 89 (Bruno Simma ed., 3d ed. 2012) (arguing that the utility of the Charter *travaux* is limited given that many problems were not foreseen in 1945, whereas for others shared meanings have been worked out over time).

63. *See*, *e.g.*, David R. Johnson & David Post, *Law and Borders: The Rise of Law in Cyberspace*, 48 STANFORD LAW REVIEW 1367 (1996).

64. John Perry Barlow, *A Declaration of the Independence of Cyberspace*, ELECTRONIC FRONTIER FOUNDATION (Feb. 8, 1996), https://projects.eff.org/~barlow/Declaration-Final.html. The "Declaration" is well-worth reading in full. However, just to illustrate its tone, it described governments as "weary giants of flesh and steel," claimed that they "have no sovereignty" online, and that their laws amount to "hostile and colonial measures." Interestingly, twenty years later, Barlow said he "[would] stand by much of the document as written." *How John Perry Barlow Views His Internet Manifesto on Its 20th Anniversary*, THE ECONOMIST (Feb. 8, 2016), http://www.economist.com/news/international/21690200-internet-idealism-versus-worlds-realism-how-john-perry-barlow-views-his-manifesto.

65. *See*, *e.g.*, U.N. Secretary-General, Developments in the Field of Information and Telecommunications in the Context of International Security 15, U.N. Doc. A/65/154 (July 20, 2010) (United Kingdom); U.N. Secretary-General, Developments in the Field of Information and Telecommunications in the Context of International Security 6, U.N. Doc. A/66/152 (July 15, 2011) (Australia); *id.* at 18 (United States); U.N. Secretary-General, Developments in the Field of Information and Telecommunications in the Context of International Security 18, U.N. Doc. A/68/156 (July 16, 2013) (United Kingdom); U.N. Secretary-General, Developments in the Field of Information and Telecommunications in the Context of International Security 4, U.N. Doc. A/68/156/Add.1 (Sept. 9, 2013) (Canada); *id.* at 12 (Iran); *id.* at 15 (Japan); *id.* at 16–17 (Netherlands); U.N. Secretary-General, Developments in the Field of Information and Telecommunications in the Context of International Security 16, U.N. Doc. A/69/112 (June 30, 2014) (Switzerland).

2013 consensus report of UN-based experts,[66] which in turn, was later endorsed by a UN General Assembly resolution.[67] In sum, the novelty of the online realm did not make it a domain free from international legal regulation.[68]

It is submitted that the same approach should apply, in principle, to State conduct in outer space. Admittedly, the initial days of space exploration were marked by similarly conservative views, according to which international law only applied on earth.[69] However, as stated by the leading early space law expert Daniel Goedhuis, "[i]nternational law is '*ipso jure*' applicable extra-terrestrially. The relevant rules of international law must be taken to regulate international relations wherever such relations take place."[70] At a general level, this is now reflected in Article III of the Outer Space Treaty, which mandates that States must carry on space activities in accordance with international law.[71]

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66. Report of the Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security, transmitted by Letter Dated 7 June 2013 from the Chair of the Group Established Pursuant to General Assembly Resolution 66/24 (2011) Addressed to the Secretary-General, U.N. Doc. A/68/98 (June 24, 2013).

67. G.A. Res. 68/243, pmbl., ¶ 18 (Jan. 9, 2014).

68. *See* TALLINN MANUAL 2.0 ON THE INTERNATIONAL LAW APPLICABLE TO CYBER OPERATIONS 3 (Michael N. Schmitt ed., 2017); *see also* Kubo Mačák, *From Cyber Norms to Cyber Rules: Re-Engaging States as Law-Makers*, 30 LEIDEN JOURNAL OF INTERNATIONAL LAW 877.

69. *See*, *e.g.*, U.N. GAOR, First Comm., 18th Sess., 1342d mtg. at 163, U.N. Doc. A/C.1/SR.1342 (Dec. 2, 1963) (United Arab Republic) ("[T]here [is] as yet no international law governing outer space."); U.N. GAOR, Comm. on the Peaceful Uses of Outer Space, U.N. Doc. A/AC.105/PV.3, at 63 (May 7, 1962) (India) ("we are not sure that international law, as we know it on earth, can or ought, *mutatis mutandis*, to be extended to outer space")) [hereinafter India Statement].

70. Daniel Goedhuis, Some Suggestions Regarding the Interpretation and the Implementation of the United Nations Outer Space Treaty of 13 December 1966, at 3 (Paper presented at the Third World Conference on World Peace Through Law, 1967), *cited in* OGUNSOLA O. OGUNBANWO, INTERNATIONAL LAW AND OUTER SPACE ACTIVITIES 24 (1975); *see also* Bin Cheng, *The Extraterrestrial Application of International Law*, 18 CURRENT LEGAL PROBLEMS 132 (1965); MANFRED LACHS, THE LAW OF OUTER SPACE: AN EXPERIENCE IN CONTEMPORARY LAW-MAKING 125 (1972, reissued 2010).

71. Outer Space Treaty, *supra* note 46, art. III

> States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding.

Accordingly, the fact that *jus in bello* rules do not contain an express provision confirming that they apply to conduct in outer space does not rule out such applicability. On the contrary, States are under a specific obligation to respect and ensure respect for the *jus in bello* "in all circumstances" as codified in Common Article 1,[72] a provision considered to reflect customary international law.[73] The phrase "in all circumstances" plainly covers those circumstances that may not have been foreseen by the drafters, including, it is submitted, military operations with a nexus to outer space.

B. *Peaceful Purposes Objection*

Another possible objection is that although international law does extend to the conduct of States in outer space, that premise does not cover all subsets of international law in the same way. In other words, not all international law is equal, and some international law is simply not designed to apply in outer space. This objection is based on the argument that all law applicable in space, as recognized by the preamble to the space law "constitution,"[74] the 1967 Outer Space Treaty, is predicated on "the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes."[75] Accordingly, because the *jus in bello* rules govern the conduct of

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It is controversial whether this provision also extends to the *jus in bello*. After all, that body of law is predicated on the assumption that the Article III goals of peace, cooperation, and understanding have broken down between the belligerent parties. Moreover, the *jus in bello* is normally understood as operating autonomously from the *jus ad bellum*, to which Article III obviously refers. *See, e.g.*, Bouvier, *supra* note 38, at 110. Article III may thus be reasonably interpreted to extend to peacetime international law (including the *jus ad bellum* rules), but not to the *jus in bello*. This matter is explored further in Section III.B *infra*.

72. S*ee also* AP I, *supra* note 43, pmbl. ("the provisions of the Geneva Conventions of 12 August 1949 and of this Protocol must be fully applied *in all circumstances* to all persons who are protected by those instruments") (emphasis added).

73. 1 CIHL, *supra* note 44, r. 139; *see also* Military and Paramilitary Activities in and against Nicaragua (Nicar. v. U.S.), 1986 I.C.J. 14, ¶ 220 (June 27).

74. *See*, *e.g.*, Tanja Masson-Zwaan & Richard Crowther, *Legal and Regulatory Issues*, *in* THE INTERNATIONAL HANDBOOK OF SPACE TECHNOLOGY 657 (Malcolm Macdonald & Viorel Badescu eds., 2014).

75. Outer Space Treaty, *supra* note 46, pmbl.

hostilities, which are decidedly non-peaceful in nature, the rules forming this body of law should not apply in outer space.[76]

In unpacking this objection, it is worthwhile to compare outer space with other areas of the global commons that States have likewise committed to use for "peaceful purposes." Here, the legal regimes of the high seas[77] and Antarctica[78] provide the best examples. Of these two, the regime of the high seas is the closer, although not perfect, analogy to that of outer space.[79] Both the high seas and outer space are clearly outside all States' territorial jurisdiction;[80] they are not subject to appropriation by States or individuals;[81] and they constitute vast, predominantly empty spaces, where prolonged human activity outside a manmade vessel is not possible.[82] Accordingly, the following analysis addresses the parallels between these two regimes.[83]

The analogous provision in the legal framework applicable to the high seas is Article 88 (the "peaceful purposes clause") of the 1982 United Nations Convention on the Law of the Sea (UNCLOS). This Article prescribes that the "high seas shall be reserved for peaceful purposes."[84] Although some

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76. *See*, *e.g.*, India Statement, *supra* note 69, at 63 ("My delegation cannot contemplate any prospect other than that outer space should be a kind of warless world, where all military concepts of this earth should be totally inapplicable.").

77. United Nations Convention on the Law of the Sea art. 88, *opened for signature* Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS].

78. Antarctic Treaty art. 1, Dec. 1, 1959, 12 U.S.T. 794, T.I.A.S. No. 4780, 402 U.N.T.S. 71.

79. *See* BIN CHENG, STUDIES IN INTERNATIONAL SPACE LAW 401 (1997); *but see infra* note 92 (noting the existence of some skepticism towards analogies of this kind within the relevant scholarship).

80. UNCLOS, *supra* note 77, art. 87; Outer Space Treaty, *supra* note 46, art. 1; *contra* Declaration of the First Meeting of Equatorial Countries art. 3(e) (Bogota Declaration), Dec. 3, 1976, I.T.U. Doc. WARC-BS 81-E (asserting that the equatorial arc of the geostationary orbit is subject to the jurisdiction of equatorial States). The Bogota Declaration was subsequently opposed by other States and claims made therein over the geostationary orbit have not been successful. *See* Steven Freeland & Ram Jakhu, *Article II*, *in* COLOGNE COMMENTARY ON SPACE LAW, *supra* note 55, at 44, ¶ 48.

81. UNCLOS, *supra* note 77, art. 89; Outer Space Treaty, *supra* note 46, art. 2.

82. KENNETH KAMLER, SURVIVING THE EXTREMES 12 (2004).

83. For a comparative analysis of the notion of peaceful purposes in the law of Antarctica and space law, *see* CHENG, *supra* note 79, at 247–52.

84. UNCLOS, supra note 77, art. 88.

early Soviet literature did claim that the clause was "to be understood generally as a prohibition of *any* military activity" on the high seas,[85] this interpretation never gained significant traction. Historically, marine spaces outside State jurisdiction have certainly not been considered immune to military activity nor to *jus in bello* regulation. That was expressly recognized in the 1900 Naval War Code,[86] a document described authoritatively as "the starting-point of a movement for codification of maritime international law."[87] The Code stipulated that "[t]he area of maritime warfare comprises *the high seas or other waters that are under no jurisdiction* and the territorial waters of belligerents."[88] This longstanding interpretation was re-endorsed during the drafting work on UNCLOS, the clearest statement to that effect coming from the United States.[89] Additionally, it has been reflected in the widely respected 1994 *San Remo Manual*, according to which "hostile actions by naval forces may be conducted in, on, or over . . . the high seas."[90] There can, therefore, be no doubt that the general legal regime of the high seas does not preclude the conducting of military activities, and that the *jus in bello* applies to such activities in spite of the peaceful use clause enshrined in UNCLOS.

Nevertheless, as stated above, the analogy between the law of outer space and the high seas (or indeed other legal regimes) is by definition an imperfect one.[91] As such, the "analogical approach" has certainly not been universally

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85. Rüdiger Wolfrum, *Military Activities on the High Seas: What Are the Impacts of the U.N. Convention on the Law of the Sea?*, *in* THE LAW OF ARMED CONFLICT INTO THE NEXT MILLENNIUM 501, 503 (Michael N. Schmitt & Leslie C. Green eds., 1998) (Vol. 71, U.S. Naval War College International Law Studies) (emphasis added); *see also id.* at 503–05.

86. U.S. Navy Department, General Orders No. 551, The United States Naval War Code of 1900: The Laws and Usages of War at Sea (June 27, 1900), *revoked by* General Order No. 150, Feb. 4, 1904, *reprinted in* 3 U.S. NAVAL WAR COLLEGE, INTERNATIONAL LAW DISCUSSIONS, 1903, at 101 (1904) [hereinafter Naval War Code].

87. 1 HERSCH LAUTERPACHT, INTERNATIONAL LAW 101 n.4 (Elihu Lauterpacht ed., 1970).

88. Naval War Code, *supra* note 86, art. 2 (emphasis added).

89. Third United Nations Conference on the Law of the Sea, 1973–82, 4th Sess., 67th plen. mtg. ¶ 81, U.N. Doc. A/CONF.62/SR.67 (Apr. 23, 1976), *reprinted in* 5 OFFICIAL RECORDS OF THE THIRD UNITED NATIONS CONFERENCE ON THE LAW OF THE SEA 62 ("The term 'peaceful purposes' did not, of course, preclude military activities generally.").

90. SAN REMO MANUAL ON INTERNATIONAL LAW APPLICABLE TO ARMED CONFLICTS AT SEA ¶ 10 (Louise Doswald-Beck ed., 1995).

91. *See supra* text accompanying note 79.

accepted in the literature.[92] In fact, since the dawn of the Space Age, it has been claimed that space activities are very specific, thus necessitating specific solutions, and that "no analogies to air law *or sea law* should be made."[93] Similarly, it is not at all clear that the notion of peaceful purposes has attained the status of a general principle of international law that would apply in the same way across various domains.[94] That is why it needs to be examined in the context of military space operations.

The space law version of the peaceful use clause can be found in Article IV(2) of the Outer Space Treaty, which provides that "[t]he Moon and other celestial bodies shall be used by all States Parties to the Treaty *exclusively for peaceful purposes*."[95] An authoritative commentary states that this provision "is commonly regarded as the focal point in the [Treaty] dealing with the military uses of outer space."[96]

It is readily apparent that Article IV(2) does not outlaw all non-peaceful activities in outer space. Rather, its scope is restricted to the moon and other celestial bodies; it does not address the use of the so-called "empty space" between celestial bodies.[97] This limitation stands in stark contrast to some statements appearing in the Treaty's *travaux préparatoires*,[98] as well as to other provisions of the Outer Space Treaty, which consistently refer to "outer

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92. *See, e.g.,* Jeffrey Prevost, *Law of Outer Space—Summarized*, 19 CLEVELAND STATE LAW REVIEW 595, 601 (1970)

> Unfortunately, the analogy is more romance than science. The sea, as relates to pertinent law, is a surface of two dimensions; space is a three dimensional volume within which man operates. Time itself contracts; gravity ceases. The shortest distance between two points is a curved line; navigation, as used on earth, is meaningless.

93. Hobe, *supra* note 55, ¶ 13 (attributing this view to an ad hoc committee of the UN General Assembly convened in May 1958).

94. Alexander Proelß, *Peaceful Purposes* ¶ 22, MAX PLANCK ENCYCLOPEDIA OF PUBLIC INTERNATIONAL LAW (Nov. 2010), http://opil.ouplaw.com/view/10.1093/law:epil/9780199231690/law-9780199231690-e1453.

95. Outer Space Treaty, *supra* note 46, art. IV(2) (emphasis added).

96. Kai-Uwe Schrogl & Julia Neumann, *Article IV*, *in* COLOGNE COMMENTARY ON SPACE LAW, *supra* note 55, at 70, ¶ 1.

97. CARL Q. CHRISTOL, MODERN INTERNATIONAL LAW OF OUTER SPACE 20 (1982); Schrogl & Neumann, *supra* note 96, at 81–82.

98. *See*, *e.g.*, U.N. GAOR, Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., 5th sess., 57th mtg. at 6, U.N. Doc. A/AC.105/C.2/SR.57 (July 12, 1966) ("The central objective was to ensure that outer space and celestial bodies were reserved exclusively for peaceful activities.") (statement by Mr. Goldberg, U.S. representative).

space," the "Moon," and "celestial bodies."[99] Furthermore, military uses of outer space have been a common and recurrent feature of State practice both before and after the adoption of the Treaty.[100]

All this offers additional support to the interpretation that the legal framework of space law does not forbid the use of outer space for military activities.[101] Many such activities do amount to military space operations as understood here; and as such, they may occur during armed conflicts.[102] In sum, although the commitment of States to the use of outer space for peaceful purposes may have important legal effects for the relevant *jus ad bellum*,[103] it does not preclude the applicability of the *jus in bello* to outer space.

### C. *Sources Quandary*

Accepting that the *jus in bello* may apply to military space activities leads to the question of whether this interim conclusion needs to be qualified depending on the source of the rules being considered. As with public international law generally,[104] the two main sources of the *jus in bello* are international treaties and customary international law.[105] In turn, each legal source poses specific problems when applied to outer space.

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99. *See* Outer Space Treaty, *supra* note 46, arts. I–III, V–VII, IX–XI, XIII (noting that all articles use the phrase "outer space, including the Moon and other celestial bodies"); *see also id.*, art. V (noting that this article uses the phrase "activities in outer space and on celestial bodies").

100. Schrogl & Neumann, *supra* note 96, ¶ 3 ("Military use has been an element of space activities since the beginning of the space age.").

101. *Cf.* Vienna Convention on the Law of Treaties art. 31(3)(b), May 23, 1969, 1155 U.N.T.S. 331 [hereinafter VCLT] (mandating that, together with the context of the terms of the treaty, their interpretation should take into account subsequent practice in the application of the treaty); *id.*, art. 32 (providing that recourse to supplementary means of interpretation, including the *travaux préparatoires* is permissible).

102. *See supra* Part II.

103. *See also* Michel Bourbonnière & Ricky J. Lee, *Legality of the Deployment of Conventional Weapons in Earth Orbit: Balancing Space Law and the Law of Armed Conflict*, 18 EUROPEAN JOURNAL OF INTERNATIONAL LAW 873, 874–882 (2007) and particularly *id.* at 877 ("the normative nature of the second paragraph of Article IV is that of a *jus ad bellum* norm").

104. HUGH THIRLWAY, THE SOURCES OF INTERNATIONAL LAW 11 (2014) (stating "treaties and custom are the two main sources of law").

105. In addition to treaties and custom, the third principal source of international law is general principles of law, as recognized by Article 38(1)(c) of the ICJ Statute. Statute of the International Court of Justice, June 26, 1945, 59 Stat. 1055, 33 U.N.T.S. 993. However, in the context of the *jus in bello* "the regulatory density through treaties and customary law

1. Treaties

For treaties, the starting point as to their applicability is Article 29 of the 1969 Vienna Convention on the Law of Treaties (VCLT), which holds that a treaty is normally binding upon each party in its entire territory.[106] This basic rule on the territorial scope of treaties is subject to the important qualification that a particular treaty may apply more narrowly or, indeed, more broadly, if that intention "appears from the treaty or is otherwise established."[107] Outer space obviously falls outside the territory of any State.[108] In this regard, it is comparable to the high seas.[109] Notably, a leading commentary to the VCLT opines that it is indeed necessary to establish the relevant intention of the parties if a treaty's application is to extend to "such areas as the high seas."[110]

Therefore, the correct interpretive approach will differ depending on the treaty in question. On the one hand, it is clear from the full title of the Hague Regulations that its provisions were to apply solely to the land territory of the parties.[111] As such, no intention to extend its applicability *qua* treaty law[112] to sea or air warfare can be presumed, and this holds *a fortiori* with regard to military space operations. To some extent, intra-territorial effects of such operations may bring them within the scope of the Hague Regulations. By way of example, the use of space assets to cause the treacherous death or

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is such that (express) and exclusive resort to general principles of law does not occur frequently." Jann Kleffner, *Sources of the Law of Armed Conflict*, *in* ROUTLEDGE HANDBOOK OF THE LAW OF ARMED CONFLICT 71, 81 (Rain Liivoja & Tim McCormack eds., 2016).

106. VCLT, *supra* note 101, art. 29 ("Unless a different intention appears from the treaty or is otherwise established, a treaty is binding upon each party in respect of its entire territory.").

107. *Id.*

108. CHENG, *supra* note 79, at 36 (stating that "the sky is literally the limit of national sovereignty").

109. *Id.* at 390 ("Under general international law, prima facie, outer space as such is, like the high seas, *extra commercium*."). *But see supra* text accompanying note 92 (noting some scholarly opposition against drawing general analogies between outer space and the high seas).

110. MARK E. VILLIGER, COMMENTARY ON THE 1969 VIENNA CONVENTION ON THE LAW OF TREATIES 391–92 (2009).

111. *See supra* note 41.

112. *But see infra* Section III.C.2 (concerning the applicability of the 1907 Hague Regulations as customary international law).

injury of enemy combatants on land would render the operation unlawful under Article 23(b).[113]

On the other hand, the scope of the Geneva Conventions must be interpreted in light of their first Article, which, as previously indicated, prescribes that States must respect and ensure respect for the Conventions "in all circumstances."[114] Although the Conventions lack a general provision specifying their territorial scope, "all circumstances" should be interpreted as extending their applicability to any location where an armed conflict may occur. This is generally accepted with regard to areas outside the territory of the belligerent States such as the high seas.[115] With the extension of human activities to outer space, the same interpretation should be endorsed, and the Conventions should be considered to be capable of extraterritorial (or, more precisely, extraterrestrial) application to outer space.[116]

2. Custom

Customary international law poses a different general problem in applying the *jus in bello* to military space operations. As a source of international law, custom has a fundamentally retrospective nature. This is because one of the well-established conditions for the emergence of customary rules is the preexistence of a "constant and uniform" practice.[117] However, due to the relative novelty of the use of space assets in times of armed conflict, State practice supporting the existing rules of custom is predominantly or exclusively

113. 1907 Hague Regulations, art. 23(b) ("[I]t is especially forbidden . . . [t]o kill or wound treacherously individuals belonging to the hostile nation or army.").

114. See *supra* note 42 and accompanying text.

115. *See, e.g.*, ERIC DAVID, PRINCIPES DE DROIT DES CONFLITS ARMÉS 256 (2008) (arguing that it is "evident" that the Geneva Conventions govern an IAC involving fighting outside a State's territory, including on the high seas); Katja Schöberl, *The Geographical Scope of Application of the Conventions*, *in* THE 1949 GENEVA CONVENTIONS: A COMMENTARY 67, 75 (Andrew Clapham, Paola Gaeta & Marco Sassòli eds., 2015) ("If enemy combatants were taken prisoners on the high seas, they too would benefit from GC III.").

116. *See also* Schöberl, *supra* note 115, at 74 ("The Conventions' extraterritorial application is supported . . . also as regards . . . outer space.").

117. Asylum (Colom. v. Peru), Judgment, 1950 I.C.J. Rep. 266, 276 (Nov. 20) (holding that custom was legally binding when practiced "in accordance with a *constant and uniform* usage") (emphasis added); Right of Passage over Indian Territory (Port. v. India), Judgment, 1960 I.C.J. Rep. 6, 40 (Apr. 12) (holding that Portugal had customary right to cross the territory of India to reach its colonial enclaves where "*constant and uniform* practice" had continued over a prolonged period) (emphasis added).

terrestrial in nature. Accordingly, even the detailed ICRC *Customary International Humanitarian Law* study does not cite evidence of space-based practice in support of any of its 161 rules.[118]

In the early days of space exploration, leading U.S. and Soviet academics argued against any extension of the existing customary rules to outer space. Thus, John Cooper claimed in 1961 that "[n]o general customary international law exists covering the legal status of outer space."[119] Two years later, Petr Ivanovich Lukin wrote that the "international law of outer space can find the reliable source of its inception and subsequent development only in international agreements."[120] By contrast, today it is no longer seriously disputed that many rules of customary international law applicable specifically to outer space activities have evolved.[121] Notably, some of these rules correspond to rules enacted in the main space law treaties,[122] however, none of these customary rules can be fairly described as rules of the *jus in bello*.[123]

Nevertheless, unless a particular rule of custom is expressly (or by its nature) limited to a particular domain, it should not automatically be seen as inapplicable to a novel domain like outer space. It makes sense that, for example, the customary rule prohibiting export of cultural property from occupied territory by definition would only apply terrestrially.[124] However, customary rules of the *jus in bello* largely regulate behavior of the belligerents without distinction as to where this conduct takes place. A useful analogy is the "law of cyber armed conflict,"[125] the body of law that applies to cyber operations executed in the context of armed conflict.[126]

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118. *See* 2 CIHL, *supra* note 44.

119. John C. Cooper, *The Rule of Law in Outer Space*, 47 AMERICAN BAR ASSOCIATION JOURNAL 23 (1961).

120. Petr Ivanovich Lukin, *To the Question of the Sources of Space Law*, 1963 QUESTIONS OF INTERNATIONAL LAW 141 (in Russian), *cited in* Vladlen S. Vereshchetin & Gennady M. Danilenko, *Custom as a Source of International Law of Outer Space*, 13 JOURNAL OF SPACE LAW 22, 26 (1985).

121. I. H. PH. DIEDERIKS-VERSCHOOR & V. KOPAL, AN INTRODUCTION TO SPACE LAW 9–12 (3d rev. ed. 2008).

122. Peter Malanczuk, *Space Law as a Branch of International Law*, 1994 NETHERLANDS YEARBOOK OF INTERNATIONAL LAW 143, 159.

123. CHENG, *supra* note 79, at 525.

124. *See* 1 CIHL, *supra* note 44, r. 41.

125. TALLINN MANUAL 2.0, *supra* note 68, pt. IV.

126. *See id.* at 375, r. 80 ("Cyber operations executed in the context of an armed conflict are subject to the law of armed conflict.").

The identification of these rules was a task undertaken by an international group of experts participating in the Tallinn Manual project under the auspices of the NATO Cooperative Cyber Defence Centre of Excellence between 2009 and 2017.[127] The manual resulting from this project stated, "because State cyber practice is mostly classified and publicly available expressions of *opinio juris* are sparse, it is difficult to definitively identify any cyber-specific customary international law."[128] However, the experts agreed that existing (non-cyber-specific) norms of customary international law apply to cyber operations and saw their task as the determination of "how such law applies in the cyber context."[129] To date, no State has expressly objected to this methodology. Indeed, on the contrary, over fifty States voluntarily chose to submit their observations on the draft second edition of the *Manual* during the so-called Hague Process.[130] The same approach should be undertaken with respect to the extension of customary *jus in bello* rules to outer space. While their applicability in general should be accepted, the key issue is precisely how such rules would apply in a specific context.

Finally, if it is accepted that, in principle, customary *jus in bello* rules apply in outer space, this may alleviate the problem of limited applicability of some of the relevant treaty law. It is well established, for instance, that the Hague Regulations have acquired the force of customary international law.[131] Hence, even if their rules may not apply *qua* treaty law, they would still govern the conduct of belligerents *mutatis mutandis* by way of customary law.[132]

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127. By way of disclosure, the present author served as a peer reviewer in the second phase of the project.

128. TALLINN MANUAL 2.0, *supra* note 68, at 3.

129. *Id.*

130. *See Over 50 States Consult Tallinn Manual 2.0*, NATO COOPERATIVE CYBER DEFENCE CENTRE OF EXCELLENCE (CCDCOE) (Feb. 2, 2016), ccdcoe.org/over-50-states-consult-tallinn-manual-20.html.

131. 22 TRIAL OF THE MAJOR GERMAN WAR CRIMINALS BEFORE THE INTERNATIONAL MILITARY TRIBUNAL 497 (1948) (stating that "by 1939 these rules laid down in the [fourth Hague] Convention were recognised by all civilised nations, and were regarded as being declaratory of the laws and customs of war"); Prosecutor v. Prlić, Case No. IT-04-74-A, Judgement, ¶ 317 (Int'l Crim. Trib. for the former Yugoslavia Nov. 29, 2017) (noting that "the Hague Regulations . . . constitute customary international law").

132. In addition to the Hague Regulations, another prominent subset of the *jus in bello* that may benefit from this interpretive approach is the law of targeting as codified in Additional Protocol I. Article 49(3) limits the applicability of the relevant section of that instrument "to any land, air or sea warfare which may affect the civilian population, individual civilians or civilian objects on land." Although this wording plainly does not include "space

This interpretation would explain why States have on occasion referred to the Hague Regulations in connection with space activities, notwithstanding that instrument's ostensible limitation to land warfare.[133]

## IV. SPECIFIC DIMENSIONS OF APPLICABILITY OF THE *JUS IN BELLO*

### A. *Material Scope of Application*

The material scope of application of the *jus in bello* determines the types of situations to which it applies. It is true that some *jus in bello* rules also apply in peacetime,[134] such as the obligations to disseminate the text of the Geneva Conventions,[135] to prosecute grave breaches,[136] and to review new weapons.[137] Still, these are exceptions, and the application of the vast majority of the rules is contingent on the existence of a situation qualifying as either an IAC or a NIAC.

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warfare" nor earth-based attacks affecting persons or objects in space, some scholars have argued that the provision should be interpreted more extensively to bring some military space operations within its purview. *See*, *e.g.*, Michel Bourbonnière, *Law of Armed Conflict (LOAC) and the Neutralisation of Satellites or* Ius in Bello Satellitis, 9 JOURNAL OF CONFLICT AND SECURITY LAW 43, 49–50 (2004); Michael N. Schmitt, *International Law and Military Operations in Space*, 10 MAX PLANCK YEARBOOK OF UNITED NATIONS LAW ONLINE 89, 115–16 (2006). However, it is submitted that this debate is largely academic, given that most targeting rules in the Protocol are considered to reflect customary international law. Hence, even if they may not apply to space operations *qua* treaty law, they would still apply by way of custom. *See also* WILLIAM H. BOOTHBY, THE LAW OF TARGETING 361–62 (2012) (opining that "customary principles and rules of targeting . . . apply to any activities from, in, or to space that may directly or indirectly affect civilians or civilian objects on land").

133. *See, e.g.,* U.N. GAOR, Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., 2d sess., 17th mtg. at 7, U.N. Doc. A/AC.105/C.2/SR.17 (June 27, 1963) ("Provisions of the Hague Convention of 1907 respecting the Laws and Customs of War on Land outlawed spying, and satellites used for the collection of intelligence material would be spies.") (statement of Mr. Fedorenko, representative of the USSR).

134. *See also* Henri Meyrowitz, *The Functions of the Law of War in Peacetime*, 26 INTERNATIONAL REVIEW OF THE RED CROSS 77 (1986).

135. GC I, *supra* note 42, art. 47; GC II, *supra* note 42, art. 48; GC III, *supra* note 42, art. 127; GC IV, *supra* note 42, art. 144.

136. GC I, *supra* note 42, art. 49; GC II, *supra* note 42, art. 50; GC III, *supra* note 42, art. 129; GC IV, *supra* note 42, art. 146.

137. AP I, *supra* note 43, art. 36.

1. International Armed Conflicts

Defined in Common Article 2 of the Geneva Conventions, the IAC concept is well understood in international law.[138] Simply put, if there is a "resort to armed force between states," the law of IAC applies.[139] In relation to military space operations, the notion of IAC poses few difficulties. A kinetic attack by one State against another, either utilizing space assets or one directed against such assets (such as the *Ghost Fleet* scenario described above[140]), would amount to the commencement of hostilities between the two States. As such, it would meet the definition of an IAC.

This opens the question of whether there is a minimum requirement of intensity of violence in relation to IACs. One can imagine an isolated incident, whereby a State would cause very limited damage to either the ground-based space infrastructure or a space object controlled by the enemy State. Some writers, supported by several national military manuals and the ICRC, take the view that there is no such minimum requirement, stating that as soon as there is hostile action between two parties, the law of armed conflict will apply.[141] Others have argued that such one-off incidents—typically border clashes or minor naval skirmishes—have not always been treated as IACs in State practice.[142]

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138. *See also* ROBERT KOLB, ADVANCED INTRODUCTION TO INTERNATIONAL HUMANITARIAN LAW 94 (2014) ("The criteria [Common Article 2] contains reflect [customary international law] criteria for the applicability of IHL in IAC.").

139. Prosecutor v. Tadić, Case No. IT-94-1-AR-72, Decision on Defence Motion for Interlocutory Appeal on Jurisdiction, ¶ 70 (Int'l Crim. Trib. for the former Yugoslavia Oct. 2, 1995).

140. *See supra* text accompanying note 34.

141. *See*, *e.g.*, RENÉ PROVOST, INTERNATIONAL HUMAN RIGHTS AND HUMANITARIAN LAW 250 (2002); ROBERT KOLB & RICHARD HYDE, AN INTRODUCTION TO THE INTERNATIONAL LAW OF ARMED CONFLICTS 101 (2008); Andrew Clapham, *The Concept of International Armed Conflict*, *in* THE 1949 GENEVA CONVENTIONS: A COMMENTARY, *supra* note 115, at 3, 16; *see also* DOD MANUAL, *supra* note 36, § 3.4.2; FEDERAL MINISTRY OF DEFENCE (GERMANY), ZDV 15/2, LAW OF ARMED CONFLICT MANUAL ¶ 203 (2013); INTERNATIONAL COMMITTEE FOR THE RED CROSS, COMMENTARY ON THE FIRST GENEVA CONVENTION: CONVENTION (I) FOR THE AMELIORATION OF THE CONDITION OF THE WOUNDED AND SICK IN THE ARMED FORCES IN THE FIELD ¶ 218 (2016) [hereinafter ICRC COMMENTARY GC I].

142. *See*, *e.g.*, Christopher Greenwood, *Scope of Application of Humanitarian Law*, *in* THE HANDBOOK OF INTERNATIONAL HUMANITARIAN LAW 45, 48 (Dieter Fleck ed., 2d ed. 2008); Andreas Paulus & Mindia Vashakmadze, *Asymmetrical War and the Notion of Armed*

The better view is that such situations should be seen as IACs in spite of their low intensity and the inconsistencies in State practice. This is because the modern law of armed conflict is based on a material conception of war, which is free from subjective considerations and does not depend on States' acknowledgement of the existence of an armed conflict.[143] The variation in practice can be explained by reasons of convenience or practicality. If a minor clash is resolved rapidly and not followed by further hostilities, States have little to gain by expressly recognizing the existence of an armed conflict.[144] However, when an isolated incident did result in lingering consequences, such as the detention of the pilot of a U.S. aircraft shot down by Syria in 1983, the one-off nature of the incident did not stop the United States from characterizing it as an IAC.[145] Therefore, it is submitted that if a military space operation amounts to a resort to force between two States, it triggers an IAC, whatever its intensity, duration, or scope.

2. Non-International Armed Conflicts

Today the vast majority of armed conflicts are non-international in nature.[146] None of these conflicts were triggered by a military space operation; however, it is certainly conceivable that such operations can augment existing NIACs.[147] Currently, military space capabilities are held almost exclusively by

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*Conflict—A Tentative Conceptualization*, 91 INTERNATIONAL REVIEW OF THE RED CROSS 95, 101 (2009).

143. *See* LOTHAR KOTZSCH, THE CONCEPT OF WAR IN CONTEMPORARY HISTORY AND INTERNATIONAL LAW 298 (1956).

144. *See* NOAM ZAMIR, CLASSIFICATION OF CONFLICTS IN INTERNATIONAL HUMANITARIAN LAW 54 (2017) (noting that, for diplomatic reasons, States may wish to avoid escalating a situation by referring to it as an armed conflict).

145. Telegram 348126 from U.S. Department of State to American Embassy at Damascus (Dec. 8, 1983), *reprinted in* 3 CUMULATIVE DIGEST OF UNITED STATES PRACTICE IN INTERNATIONAL LAW 1981–1988, at 3456–57 (1995). Hays Parks, who was then Special Assistant for Law of War Matters to the Judge Advocate General of the U.S. Army, later reported that "[u]pon receipt of that demarché, the Syrians complied" with the U.S. request to provide prisoner of war protection for the captured pilot. W. Hays Parks, *Special Forces' Wear of Non-Standard Uniforms*, 4 CHICAGO JOURNAL OF INTERNATIONAL LAW 493, 500 n.11 (2003).

146. Marie Allansson, Erik Melander & Lotta Themnér, *Organized Violence, 1989–2016*, 54 JOURNAL OF PEACE RESEARCH 574, 576 (2017).

147. *See supra* text accompanying notes 31–35 for the distinction between these two types of operations.

a small club of space-faring States.[148] If engaged in a NIAC, these countries may rely on their space assets, for example, to improve precision targeting by ground and air forces. Conversely, armed groups could attempt to jam a State's satellite signals, thus reducing their adversary's combat effectiveness. Both types of conduct would qualify as military space operations as understood in this article. However, because the criteria for the existence of a NIAC under international law are more demanding than those for IACs, either activity, if undertaken outside an existing conflict, is unlikely to trigger a NIAC.

Although Common Article 3 does not contain an express definition of a NIAC, its interpretation in modern case law and State practice confirms that it implies the twofold requirements of minimum organization and intensity.[149] First, the non-State party to the conflict must be militarily organized, the indicators of which include responsible command, adherence to military discipline and the capability to respect the *jus in bello*.[150] This means that destructive hostile activities by a private actor, such as a space technology company, would not trigger the applicability of the *jus in bello* unless it was organized and structured in a manner similar to that of an armed group.[151] With respect to armed groups engaged in hostile space operations, the criterion of minimum organization would apply in the same manner as it does to groups engaged in terrestrial conflicts.[152]

Second, the hostilities must surpass a certain level of intensity.[153] To use a terrestrial example, this criterion would be met if a State's police forces were no longer capable of dealing with the situation, and therefore the military forces would have to be mobilized in order to defeat the armed group.[154]

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148. *See* MOLTZ, *supra* note 9, at 132–40.

149. *See, e.g.*, Prosecutor v. Akayesu, Case No. ICTR-96-4-T, Judgment, ¶ 625 (Sept. 2, 1998); MARCO SASSÒLI & ANTOINE A. BOUVIER, HOW DOES LAW PROTECT IN WAR? 109 (2006); KOLB & HYDE, *supra* note 141, at 78; SANDESH SIVAKUMARAN, THE LAW OF NON-INTERNATIONAL ARMED CONFLICT 167–80 (2012); DOD MANUAL, *supra* note 36, § 3.4.2.2.

150. Prosecutor v. Limaj, Case No. IT-03-66-T, Judgment, ¶¶ 89–90, 94–134 (Int'l Crim. Trib. for the former Yugoslavia Nov. 30, 2005).

151. I am grateful to Chris Borgen for bringing this scenario to my attention.

152. *See, e.g.*, Dapo Akande, *Classification of Armed Conflicts: Relevant Legal Concepts*, *in* INTERNATIONAL LAW AND THE CLASSIFICATION OF CONFLICTS 32, 51–52 (Elizabeth Wilmshurst ed., 2012).

153. Prosecutor v. Limaj, Case No. IT-03-66-T, Judgment, ¶¶ 89–90, 135–70 (Int'l Crim. Trib. for the former Yugoslavia Nov. 30, 2005).

154. *See, e.g.,* Prosecutor v. Boškoski & Tarčulovski, Case No. IT-04-82-T, Trial Chamber Judgment, ¶ 177 (Int'l Crim. Trib. for the former Yugoslavia July 10, 2008).

In this regard, a single attack against a State's space infrastructure would normally not suffice to trigger a NIAC.[155] The victim State would likely interpret an incident of this kind as a terrorist act and respond under the law enforcement paradigm.[156] However, if, for example, a jamming attack against the State's space systems was followed by large-scale ground-based confrontations resulting in a considerable number of casualties and significant material destruction, the situation would qualify as a NIAC irrespective of the fact that the "first shot fired" would have been a space operation.[157]

### B. *Personal Scope of Application*

The personal dimension of applicability of the *jus in bello* establishes which persons are protected by the law and whose activities the law regulates. More precisely, this section analyses the *passive* personal scope of application of the relevant law. It does not address what is sometimes referred to as the *active* personal scope, that is, who is bound by the law and on what grounds.[158]

In this regard, the *jus in bello* is based on a fundamental distinction between combatants and non-combatants, a distinction that permeates the entirety of this body of law.[159] While persons qualifying as combatants may be attacked, this is not the case with respect to persons who do not or who are

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155. *Cf.* Prosecutor v. Kordić & Čerkez, Case No. IT-65-14/2-A, Appeals Chamber Judgment, ¶ 341 (Int'l Crim. Trib. for the former Yugoslavia Dec. 17, 2004) (holding that the intensity requirement is "significant in excluding mere cases of civil unrest or single acts of terrorism").

156. *Id.*; *see also* Yuval Shany, *The International Struggle against Terrorism—the Law Enforcement Paradigm and the Armed Conflict Paradigm*, THE ISRAEL DEMOCRACY INSTITUTE (Sept. 10, 2008), https://en.idi.org.il/articles/6934.

157. *Cf.* Boškoski & Tarčulovski, Case No. IT-04-82-T, Judgment, ¶ 190 (Int'l Crim. Trib. for the former Yugoslavia July 10, 2008)

> [W]hile isolated acts of terrorism may not reach the threshold of armed conflict, when there is protracted violence of this type, especially where they require the engagement of the armed forces in hostilities, such acts are relevant to assessing the level of intensity with regard to the existence of an armed conflict.

*See also* Prosecutor v. Haradinaj et al., Case No. IT-04-84*bis*-T, Judgment, ¶ 394 (Int'l Crim. Trib. for the former Yugoslavia Nov. 29, 2012) (holding that the factors to be taken into account in assessing the intensity of the conflict include "the extent of destruction and number of casualties caused").

158. On the key question as to why the *jus in bello* binds non-State armed groups, see SIVAKUMARAN, *supra* note 149, at 236–49; YORAM DINSTEIN, NON-INTERNATIONAL ARMED CONFLICTS IN INTERNATIONAL LAW 63–73 (2014).

159. 1 CIHL, *supra* note 44, r. 1.

no longer directly participating in hostilities.[160] The latter—which includes the wounded, sick and shipwrecked, prisoners of war and civilians—are referred to as "protected persons" and the relevant *jus in bello* rules guarantee them material protection.[161]

With respect to military space operations, this means that it is necessary to determine the legal status of persons engaged in such activities. The central question in that regard is how to classify members of State armed forces who are engaged in activities in outer space during an armed conflict. This question arises because there is a tension between the role ascribed to such persons by the *jus in bello* and general space law.

Under the *jus in bello*, the status of members of the armed forces is clear: unless they fall into one of the listed exceptions, such as medical or religious personnel, the law classifies them as combatants.[162] This qualification carries several important consequences. Combatants can be targeted by the enemy at all times; they cannot be prosecuted for their mere participation in hostilities and, if captured, they are to be treated as prisoners of war (POWs).[163] Although POWs are subject to extensive protections under the *jus in bello*,[164] they may lawfully be kept in detention until the close of hostilities,[165] which may translate into months or even years of internment for individual captives.

By contrast, space law prescribes that astronauts are to be regarded by all States as "envoys of mankind."[166] Admittedly, there is some doubt as to whether this term itself carries specific legal implications, with a leading space law commentary describing it as "only a figure of speech."[167] There is no question, however, that space law mandates that all States owe certain duties to persons so designated. In particular, States must give astronauts "all

160. AP I, *supra* note 43, arts. 41(1), 43(2), 48.

161. *See also* Kleffner, *supra* note 31, at 55–56.

162. AP I, *supra* note 43, art. 43(2); GC III, *supra* note 42, art. 33.

163. EMILY CRAWFORD & ALISON PERT, INTERNATIONAL HUMANITARIAN LAW 87 (2015).

164. *See especially* GC III, *supra* note 42, *passim*; AP I, *supra* note 43, arts. 43–47, 67(2), 85(4)(b).

165. GC III, *supra* note 42, art. 118.

166. Outer Space Treaty, *supra* note 46, art. V(1).

167. Frans Gerhard von der Dunk & Gérardine Meishan Goh, *Article V*, *in* COLOGNE COMMENTARY ON SPACE LAW, *supra* note 55, at 94, ¶ 17.

possible assistance"[168] in time of need and, if astronauts fall into the hands of a third State following an emergency or unintended landing, that State must return them, safely and promptly, to the State where their space vehicle is registered.[169]

Plainly, the two sets of obligations—those under the *jus in bello* and those mandated by space law—are in tension, if not outright conflict. As noted by Ramey, "[i]t would simply be incongruous for one person to simultaneously constitute a combatant and an 'envoy of mankind.'"[170] Therefore, does the personal scope of application of the *jus in bello* extend to astronauts?

In order to answer this question, we must look beyond the isolated provisions that may indeed appear incompatible. The tension starts to dissipate once the context of these rules is taken into account and the object and purpose of the treaties in which they are contained is considered.[171] Rules on combatancy, given their grounding in the *jus in bello*, presume the existence of an armed conflict. The category of combatants, then, is plainly designed to cover those persons who materially contribute to the efforts of the belligerents to prosecute an existing armed conflict. Conversely, the existing treaty framework of space law has been created to govern space exploration and peaceful uses of outer space.[172] Astronauts can, accordingly, be seen as "envoys of mankind," and benefit from the concomitant obligations of third States only when not engaged in hostile actions. This interpretation is supported by the *travaux préparatoires* of the Rescue and Return Agreement, which records the statements of many delegations emphasizing the humanitarian motives underpinning the draft treaty and that it was meant to cover astronauts while carrying out activities in the context of peaceful space exploration.[173]

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168. Outer Space Treaty, *supra* note 46, art. V(1); *see also* Rescue and Return Agreement, *supra* note 46, art. 2 (using a slightly different formulation, according to which the State in question "shall immediately take all possible steps to rescue them and render them all necessary assistance").

169. Outer Space Treaty, *supra* note 46, art. V(1); Rescue and Return Agreement, *supra* note 46, art. 4.

170. Ramey, *supra* note 49, at 152.

171. VCLT, *supra* note 101, art. 31(1).

172. von der Dunk & Goh, *supra* note 167, at 101.

173. *See especially* U.N. GAOR, Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., Special Sess., 86th mtg. at 4 (Soviet Union), 10 (Japan), 12 (India), 14 (France), 15 (Hungary), 17 (Canada), 18 (Bulgaria), U.N. Doc. A/AC.105/C.2/SR.86 (Feb. 9, 1968);

Therefore, the personal applicability of the *jus in bello* extends to astronauts, but the mere fact of the existence of an armed conflict does not necessarily convert them to combatants, even if they formally belong to the armed forces of one of the belligerent parties. It has been suggested in this regard that non-belligerent astronauts would come under a "modified *hors de combat* concept."[174] However, the term *hors de combat* is well defined in the *jus in bello* and it would be inadvisable to reconceptualize it beyond the currently accepted categories, all of which presume some kind of incapacitation of persons previously eligible for combatant status.[175] Any attempt to redefine this longstanding legal term would risk decreasing its effectiveness and undermining the current "interlocking and comprehensive system" established by the existing rules.[176]

The better view is that astronauts maintain their status as "envoys of mankind" and the concomitant rights unless and until they engage in conduct with a material nexus to an armed conflict.[177] If and when they do so,[178]

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U.N. GAOR, Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., Special Sess., 87th mtg. at 10 (Mexico), U.N. Doc. A/AC.105/C.2/SR.87 (Feb. 2, 1968).

174. Stephens & Steer, *supra* note 49, at 87.

175. *See* AP I, *supra* note 43, art. 41(2)

> A person is *hors de combat* if: (a) He is in the power of an adverse Party; (b) He clearly expresses an intention to surrender; or (c) He has been rendered unconscious or is otherwise incapacitated by wounds or sickness, and therefore is incapable of defending himself; provided that in any of these cases he abstains from any hostile act and does not attempt to escape.

176. COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949, ¶ 1603 (Yves Sandoz, Christophe Swinarski & Bruno Zimmermann eds., 1987) [hereinafter COMMENTARY ON THE ADDITIONAL PROTOCOLS].

177. This standard is analogical to the notion of "acts harmful to the enemy" relied on by several rules of the law of armed conflict in order to define when special protection guaranteed to specific categories of persons or objects shall cease: *see, e.g.,* GC I, *supra* note 42, art. 21; GC II, *supra* note 42, art. 34; GC IV, *supra* note 42, art. 19; AP I, *supra* note 43, arts. 13, 23(3), 65, and 67(1)(e). I am grateful to Laurent Gisel for drawing this analogy to my attention.

178. *Cf.* ICRC, COMMENTARY: GENEVA CONVENTION FOR THE AMELIORATION OF THE CONDITION OF THE WOUNDED AND SICK IN ARMED FORCES IN THE FIELD 200 (Jean S. Pictet ed., 1952) (noting that specific conduct qualifies as an "act harmful to the enemy" if and when its "purpose or effect . . . is to harm the adverse Party, by facilitating or impeding military operations").

their conduct then *eo ipso* negates their original status[179] and activates the *jus in bello* rules according to which they are to be seen as combatants and may thereafter be targeted by the enemy.[180] This interpretation is consistent with the goals underpinning both bodies of law and provides a practical resolution to the apparent normative tension. It also reflects existing State practice, which acknowledges that non-hostile military activities of astronauts belonging to the armed forces of an adversary are unobjectionable and do not affect their status.[181]

### C. *Temporal Scope of Application*

The temporal scope of application of the *jus in bello* ordinarily coincides with its material scope.[182] In other words, the law begins to apply the moment the criteria for the existence of an armed conflict are met.[183] However, physical attributes of outer space pose specific problems for the applicability of the law developed for terrestrial conflicts, because time can appear to pass *more slowly* due to the great distances involved in space warfare.

In terrestrial combat, the impact of a physical attack normally materializes almost instantaneously after initiation of the attack. By contrast, an earth-to-space kinetic attack will be underway for up to several hours before its impact is felt. That is how long it takes a modern direct ascent ASAT

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179. *See also* von der Dunk & Goh, *supra* note 167, at 101 (stating that "threats to national security . . . might well deprive astronauts of offending member States of their accrued rights under the Outer Space Treaty").

180. *See supra* text accompanying notes 162–65.

181. *See*, *e.g.*, U.S. Military Space Activities, *supra* note 7, at 5 (stating, with respect to a Soviet astronaut engaged in acts of observation of the earth from outer space, that it is impossible "to distinguish between Major Titov as a space traveller and as an officer of the Soviet Air Force" and that the United States "cannot perceive any reason to object" to such activities); *see also* U.N. GAOR, Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., 4th sess., 46th mtg., at 4, U.N. Doc. A/AC.105/C.2/SR.46 (Nov. 30, 1965) (statement by Mr. Yankov, representative of Bulgaria) (stating that "the phrase 'envoys of mankind' could not be interpreted as covering astronauts engaged in military activities which were a threat to world peace" and that "it was not possible to suggest that a State had a legal obligation to return the personnel of a spacecraft which had been engaged in military activities against that State and which was a threat to peace").

182. *See supra* text accompanying notes 1354–37 for some exceptions to this rule.

183. Jann K. Kleffner, *Human Rights and International Humanitarian Law: General Issues*, *in* THE HANDBOOK OF THE INTERNATIONAL LAW OF MILITARY OPERATIONS 35, 49 (Terry D. Gill & Dieter Fleck eds., 2d ed. 2015).

weapon to reach satellites in the geosynchronous orbit (approximately 36,000 kilometers above mean sea level).[184] By way of comparison, a modern intercontinental ballistic missile (ICBM) takes thirty minutes or less to reach almost any place on earth.[185] The launch of an ASAT weapon may be detected by missile warning satellites, but there would still be considerable time between launch and impact.

This poses a practical question, namely when exactly does the law begin to apply in such situations? Is it at the moment the weapon is launched, or only hours later once it has reached its target, and then only if the target is hit? There are few parallels in terrestrial warfare, the most apparent of which is the firing of an ICBM. However, perhaps because of the relatively short time that it takes an ICBM to reach its target, the issue has largely been left unaddressed in modern scholarship.[186]

The key to the answer is in the definition of IAC—"any . . . armed conflict which may arise between two or more" States.[187] In other words, as soon as there is hostile action by one State against another State, the law will apply.[188] It is submitted that the launch of an anti-satellite weapon against another State's space assets amounts to hostile action against that State. This conclusion is not affected by the reaction of the victim State, including possible evasive maneuvers of its satellite that might prevent any destructive impact altogether.[189] If the attempted attack is not followed by any belligerent

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184. Brian Weeden, *Through a Glass, Darkly: Chinese, American, and Russian Anti-Satellite Testing in Space*, THE SPACE REVIEW (Mar. 17, 2014), http://www.thespacereview.com/article/2473/1.

185. DEVELOPMENT, CONCEPTS AND DOCTRINE CENTER, U.K. MINISTRY OF DEFENCE, THE UK MILITARY SPACE PRIMER ¶ 311, at 3–5 (2010), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/33691/SpacePrimerFinalWebVersion.pdf.

186. *Cf.* PROGRAM ON HUMANITARIAN POLICY AND CONFLICT RESEARCH, MANUAL ON INTERNATIONAL LAW APPLICABLE TO AIR AND MISSILE WARFARE (2009), http://ihlresearch.org/amw/HPCR%20Manual.pdf [hereinafter AMW MANUAL]. Despite its stated goal to present a "methodical restatement of existing international law on air and missile warfare the AMW Manual does not discuss this issue either in its "black-letter rules" or in the detailed commentary thereto. *Id.* at 2.

187. GC I, *supra* note 42, art. 2; GC II, *supra* note 42, art. 2; GC III, *supra* note 42, art. 2; GC IV, *supra* note 42, art. 2; *see also supra* note 139 and accompanying text.

188. *See supra* Section IV.A.1.

189. *Cf.* Weeden, *supra* note 184 ("Given this lengthy flight time, it is much easier for a target satellite in GEO to detect the attack and possibly maneuver to avoid the intercept . . . .").

conduct by either party, the applicability of the *jus in bello* would be very brief, but it would still have materialized.

By contrast, a single attack of this type is unlikely to bring about the applicability of the law of NIAC. As discussed above, the threshold requirement of intensity raises the bar of necessary violence above one-off incidents.[190] However, it is not so much the passage of time but the intensity of hostilities that determines the existence of a NIAC.[191] The peculiarities of launching kinetic ASAT weapons thus do not affect the applicability of the law beyond the analysis already presented.

### D. *Geographic Scope of Application*

How wide (or, more precisely, how *high*) is the geographic reach of the *jus in bello*? We have seen that there is no general bar on its applicability to outer space. Moreover, this issue poses few problems for the applicability of the law to IACs. The reference to the "territory of a High Contracting Party" in Common Article 2, although certainly ground-focused, operates only as an add-on to the earlier definitions of "declared war" and "any other armed conflict" by *extending* the applicability of the law to occupied territories. As a matter of principle, the law of IAC applies to the conduct of hostilities between two or more States, wherever it takes place.[192] Despite some learned opinion to the contrary, this must therefore also include outer space.[193] Indeed, this view has been expressly confirmed in the authoritative proclamations of some States.[194]

The question of geographic scope of application poses a considerably greater challenge for the law of NIAC. The central provision of this law,

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190. *See supra* notes 153–57 and accompanying text.

191. *Cf.* Prosecutor v. Haradinaj et al., Case No. IT-04-84-T, Judgment, ¶ 49 (Int'l Crim. Trib. for the former Yugoslavia Apr. 3, 2008) ("The criterion of protracted armed violence has . . . been interpreted . . . as referring more to the intensity of the armed violence than to its duration").

192. *But see supra* notes 112, 131–33 and accompanying text for the specific case of the 1907 Hague Regulations.

193. *But see* Kleffner, *supra* note 31, at 56 (omitting outer space from the list of domains in which military operations may be carried out in IACs).

194. *See*, *e.g.*, DOD MANUAL, *supra* note 36, § 14.10.2.2; GERMAN NAVY, COMMANDER'S HANDBOOK: LEGAL BASES FOR THE OPERATIONS OF NAVAL FORCES ¶ 79 (2002), http://usnwc.libguides.com/ld.php?content_id=2998104.

Common Article 3, expressly speaks of an "armed conflict not of an international character occurring *in the territory* of one of the High Contracting Parties." Similarly, according to the settled case law of the ad hoc criminal tribunals, the geographical scope of the *jus in bello* is the entirety of the *territory* of the State where the hostilities are taking place.[195] Even if one accepts a broad understanding of the notion of "territory," which would include the land territory, internal waters, territorial sea, and national airspace of a State, this understanding would still not extend to outer space.

Yet, the notion of NIAC has undergone evolution, particularly since the beginning of the twenty-first century. A number of conflicts, which did not feature States on opposite sides but which did cross international borders, have been classified as NIACs, thus defying the intra-territorial conceptualization of this notion. For example, the Afghan Taliban has operated from Pakistan's territory in its conflict with the government of Afghanistan,[196] and Colombian armed forces have fought the Revolutionary Armed Forces of Colombia in Ecuadorian territory.[197] The United States in particular takes the

195. *See, e.g.*, Prosecutor v. Akayesu, Case No. ICTR-96-4-T, Judgment, ¶ 635 (Sept. 2, 1998); Prosecutor v. Kayishema & Ruzindana, Case No. ICTR-95-1-T, Judgment, ¶¶ 182–83 (May 21, 1999); Prosecutor v. Rutaganda, Case No. ICTR-96-3-T, Judgment, ¶¶ 101–102 (Dec. 6, 1999); Prosecutor v. Musema, Case No. ICTR-96-13-T, Judgment, ¶ 283 (Jan. 27, 2000); Prosecutor v. Bagilishema, Case No. ICTR-95-1A-T, Judgment, ¶ 101 (June 7, 2001); Prosecutor v. Semanza, Case No. ICTR-97-20-T, Judgment, ¶ 367 (May 15, 2003).

196. *See*, *e.g.*, Aerial Drone Deployment on 4 October 2010 in Mir Ali/Pakistan, 157 INTERNATIONAL LAW REPORTS 722, 742 (Germany, Federal Prosecutor General, Decision to Terminate Proceedings 2013), https://www.justsecurity.org/wp-content/uploads/2015/07/german-federal-prosecutor-general-decision-drone-strike-pakistan.pdf (finding that "the Afghan Taliban's use of the FATA region as a haven and staging area has evidently caused the Afghan conflict to 'spill over' onto this particular part of Pakistan's national territory").

197. *See*, *e.g.*, Communique, Ministry of Foreign Affairs, Ecuador, Ecuadorian Government Protests Assassination of Raul Reyes in Ecuador (Mar. 1, 2008), http://ecuador-rising.blogspot.com/2008/03/ecuadorian-government-protests.html (rejecting "the presence of Colombian irregular groups in the country" and "reiterat[ing] its firm decision not to allow the territory of the nation to be used by others to carry out military operations or to be used as a base of operations, as part of the Colombian conflict"), *cited in* Felicity Szesnat & Annie R. Bird, *Colombia*, *in* INTERNATIONAL LAW AND THE CLASSIFICATION OF CONFLICTS, *supra* note 152, at 203, 217 n.114. Szesnat and Bird note that this statement "could be interpreted to mean that Ecuador view[ed] the conflict as being a non-international armed conflict solely between Colombia and FARC." *Id.*

view that the characterization of a situation as a NIAC depends on the status of the actors, not the geography of the fighting.[198]

Accordingly, we should not read too much into the wording of Common Article 3. On close inspection, it is clear that the provision does not specifically mandate that the law should apply *solely* intra-territorially. The wording "occurring in the territory" reflects the historical fact that before 1949, conflicts between a State and a non-State armed group, or those between several such groups, were practically always confined to the territory of a single State.[199] However, at the time Additional Protocol II was being drafted in the 1970s, the question of whether to limit its application *ratione loci* in any way was addressed—and the drafters decided against it.[200] In the words of the authoritative ICRC *Commentary*, this was because "the applicability of the Protocol follows from a criteria [sic] related to persons, and not to places."[201]

The same interpretation should be used with respect to the applicability of the law of NIAC in general. In other words, those rules apply to the conduct of persons with a nexus to the conflict, irrespective of the "places" in which such persons acted and where the effect of their conduct may occur.[202] This broad interpretation of the geographical scope of the *jus in bello* accords with the teleological purpose underpinning this body of law, namely the protection of victims of war.[203] The utilization of military space operations and the extension of combat to outer space should not rule out the protections and legal certainty guaranteed by the *jus in bello*.

## V. CONCLUSION

With the increasing use of space assets for military purposes, understanding the legal framework applicable to military uses of outer space is becoming

198. Hamdan v. Rumsfeld, 548 U.S. 557, 629–30 (2006); DOD MANUAL, *supra* note 36, § 17.1.1.2.

199. *See* ICRC COMMENTARY GC I, *supra* note 141, art. 3, ¶ 455 n.169.

200. 8 OFFICIAL RECORDS OF THE DIPLOMATIC CONFERENCE ON THE REAFFIRMATION AND DEVELOPMENT OF INTERNATIONAL HUMANITARIAN LAW APPLICABLE IN ARMED CONFLICTS, GENEVA (1974–1977), at 211, ¶¶ 47–48 (1978).

201. COMMENTARY ON THE ADDITIONAL PROTOCOLS, *supra* note 176, ¶ 4490.

202. *See* Louise Arimatsu, *Territory, Boundaries and the Law of Armed Conflict*, 12 YEARBOOK OF INTERNATIONAL HUMANITARIAN LAW 157, 189 (2009); SIVAKUMARAN, *supra* note 149, at 251–52.

203. *See* AP II, *supra* note 43, pmbl., ¶ 3 ("[e]mphasizing the need to ensure a better protection for the victims of [non-international] armed conflicts").

ever more important. This author shares Bill Boothby's hope that States renounce as unacceptable all acts of hostility in outer space.[204] However, historical experience shows that whenever humankind unlocked a new domain, it soon found ways to utilize it for war.

Fortunately, constraints on warfare prescribed by the *jus in bello* as the body of international law applicable in times of armed conflict do reach beyond terrestrial bounds. This article has shown that none of the general objections that could be raised against such applicability is particularly convincing. This conclusion is consistent with the emerging practice of States and the statements of relevant actors, such as the ICRC. In fact, to the extent the legal ramifications of space warfare have been considered at all, there seems to be agreement that the *jus in bello* follows hostilities to outer space.[205]

At the same time, the question of whether the law of war applies to outer space should not be conflated with the separate question of whether war in outer space can be justified. Acknowledging that the law governs a certain type of conduct does not legitimate that conduct.[206] Quite the contrary, restrictions mandated by the *jus in bello* serve to constrain the behavior of belligerents during armed conflict. Moreover, even if the prospect of armed conflict in space cannot be ruled out entirely, it should at least be moderated by the limitations imposed by the law. However, even if the general applicability of the *jus in bello* to military space operations is accepted, several legal questions remain unresolved.

This article has classified some of these challenges by the specific dimensions of applicability: material, personal, temporal, and geographic. It has

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204. Boothby, *supra* note 19, at 214.

205. *See, e.g.*, DOD MANUAL, *supra* note 36, § 14.10.2.2 ("[L]aw of war treaties and the customary law of war are understood to regulate the conduct of hostilities, regardless of where they are conducted, which would include the conduct of hostilities in outer space."); *Weapons: ICRC Statement to the United Nations, 2015*, INTERNATIONAL COMMITTEE OF THE RED CROSS (Oct. 15, 2015), https://www.icrc.org/en/document/weapons-icrc-statement-united-nations-2015 (noting that "any hostile use of outer space in armed conflict—that is, any use of means and methods of warfare in, from, to or through outer space—must comply with IHL").

206. *Cf.* INTERNATIONAL COMMITTEE OF THE RED CROSS, INTERNATIONAL HUMANITARIAN LAW AND THE CHALLENGES OF CONTEMPORARY ARMED CONFLICTS 40 (2015), https://www.icrc.org/en/document/international-humanitarian-law-and-challenges-contemporary-armed-conflicts ("[A]sserting that IHL applies to cyber warfare is not an encouragement to militarize cyberspace and should not, in any way, be understood as legitimizing cyber warfare.").

shown that military space operations may trigger international armed conflicts and, in specific circumstances, non-international armed conflicts. It has proposed a solution to the problem of parallel personal applicability of the *jus in bello* and international space law to military astronauts. It has argued that, with respect to protracted space operations, the temporal scope of application of the law commences at the moment of the first hostile action—not after the impact of such conduct is felt. Finally, it has proposed an interpretive approach moving away from restricting the law *ratione loci* and towards the criterion of nexus with an ongoing conflict.

Accordingly, the analysis in this article provides ample ammunition against those who might deny, as Baxter had warned, that the *jus in bello* applies at all.[207] It confirms that the *jus in bello* applies in general to space operations and it clarifies the situations, persons, times, and places to which it applies. In sum, the law does not fall silent in times of war, not even in times of Silent War.

207. Baxter, *supra* note 14, at 1–2.