University of Vienna – Faculty of Law – Department of European, International and Comparative Law

Dissertation Proposal

Working Title:

Armed Conflict in Outer Space

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Abbreviations:

ASAT	Anti-satellite weapon
COPUOS	(United Nations) Committee on the Peaceful Uses of Outer Space
EU	European Union
ICBM	Intercontinental ballistic missile
ICJ	International Court of Justice
IHL	International Humanitarian Law
NATO	North Atlantic Treaty Organisation
OST	1967 Outer Space Treaty
PAROS	Prevention of an Arms Race in Outer Space
PPWT	[Draft] Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects
UNIDIR	United Nations Institute for Disarmament Research
UNTS	United Nations Treaty Series
VCLT	Vienna Convention on the Law of Treaties
WMD	Weapons of Mass Destruction

A.) Research Proposal Outline

I.) Background and Introduction

The 1990-91 Gulf War has been dubbed the first "space war" due to the use of space infrastructure – GPS, communication, navigation, reconnaissance – for military operations. Ideas of space warfare are much older, and reached their first peak during the Cold War: one may think of the 1957 "Sputnik crisis" or U.S. President Ronald Reagan's 1983 "Star Wars" speech as typical examples of that era. In recent years, a chain reaction of establishing dedicated national Space Forces – among others France, India and the U.S. in 2019, Japan in 2020, the U.K. in 2021 (with which all five permanent members of the UN Security Council have a Space Command now) – has revived the debates on the legality of military operations in outer space. The North Atlantic Treaty Organisation (NATO) as an important military alliance also declared space an operational domain in 2019 and established its own Space Command in 2020. The People's Republic of China as a spacefaring nation on the rise officially designated outer space as a domain of warfare already in its 2015 defence white paper[1] and developed an "integrated air and space" (*kōngtiān yītǐ*, 空天一体) military strategy; its national space program has always been managed by the People's Liberation Army despite the country's official rhetoric against the weaponisation of space. It is again China who triggered a recent "show of force" chain reaction as it successfully tested an anti-satellite (ASAT) weapon in 2007[2], followed by the U.S. in 2008[3], Russia between 2014 and 2020, India in 2019[4], and again Russia on 15 November 2021[5], while in March 2021 France conducted the first outer space military exercise by a European state as a "stress test" of its defences against such attacks. There are also new developments on hypersonic missiles which cross into outer space as they utilise the low Earth orbit[6] (for example China's alleged test of a hypersonic glide vehicle on 27 July 2021 which provoked a new "Sputnik moment" in the U.S.; several countries are currently developing these weapons). In response, on 21 January 2022, the U.S. Space Force launched two satellites to boost its Geosynchronous Space Situational Awareness Program with the U.S. Space Force USSF-8 mission, but the U.S. government also declared on 18 April 2022 that it wishes to adopt a unilateral moratorium on the destructive testing of direct-ascent ASAT weapons (which however does not

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1 State Council Information Office of the People's Republic of China, 'China's Military Strategy' (2015) <http://english.www.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm> accessed 21 May 2022.

2 It destroyed China's own FY-1C weather satellite. It was not the first such test – the first one dates as far back as 1959 – but the first in the current new peak of the space arms race.

3 Taking out its U.S.A.-193 spy satellite.

4 Against the Microsat-R imaging satellite.

5 Which destroyed an old Soviet spy satellite, Kosmos-1408.

6 The low Earth orbit, or LEO, is where most of humankind's artificial space objects are, including the Hubble space telescope, the International Space Station or the Tiangong Space Station.

preclude the development of such weapons, nor their testing against simulated targets[7]). Another current issue are the ever-multiplying options for cyber attacks against space assets which can have equally grave consequences when compared to kinetic attacks[8].

Thus, while military uses of outer space have a history spanning six decades, there is a current peak in the policies of spacefaring nations to at least seriously consider the possibilities of conflicts in space and to actively develop their military capabilities. We are witnessing a new arms race in outer space, while at the same time the importance of space assets and humankind's dependency on the critical services they provide is higher than ever and still rising.

II.) Proposed Research Questions

The above considerations lead me to ask two research questions:

1. How does existing international law apply to armed conflict in or from outer space?

There is no "law of armed conflict in outer space"; rather, there is a new intersection between the classic bodies of space law and international humanitarian law (IHL) which has been little explored in academic writing yet.

Art. III of the 1967 Outer Space Treaty (OST) provides in principle for the application of the UN Charter in outer space, including the prohibition of the use of force (Art. 2(4)), the right to self-defence (Art. 51) and collective action (Art. 42, 53), thus the *ius ad bellum*, as well as the application of other international treaties and customary law. Those would include the *ius in bello* or IHL proper, and further related treaties such as the 1963 Partial Nuclear-Test-Ban Treaty, the 1978 ENMOD Convention, non-proliferation treaties, treaties limiting the use of certain weapons, etc.

Thus, the OST explicitly states that other international law applies in outer space. Conversely, there is no rule stating that outer space law would not apply in the case of armed conflict[9], nor any explicit rules allowing for specific derogations e.g. for reasons of national security.

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7 And the previous *de facto* moratorium from 1985 did not prevent the recent developments.

8 A most recent example is the cyber attack on 24 February 2022 against the satellite broadband internet service provided by Viasat in the Ukraine, which occurred within the ongoing war in the Ukraine and was allegedly executed by the Russian Federation. While the attack directly compromised only ground units and not Viasat's satellite itself, it made the entire service unavailable, also for users beyond the Ukrainian national borders. Viasat, 'KA-SAT Network Cyber Attack Overview' (30 March 2022) <https://www.viasat.com/about/newsroom/blog/ka-sat-network-cyber-attack-overview/> accessed 21 May 2022.

9 While such instruments are rare, they do exist in international law. One example would be the 1983 International Convention against the Taking of Hostages, 1316 UNTS 205, Art. 12.

IHL, on the other hand, specifically allows for the continued application of other international law in certain cases[10]. The general effect of the outbreak of hostilities on other (peacetime) international treaties, however, is subject to academic debate: Art. 73 of the Vienna Convention on the Law of Treaties (VCLT) states that the VCLT does not regulate the question[11], the International Court of Justice (ICJ) has only brushed upon it without making any general statements[12], and the International Law Commission (ILC) has produced a proposal, the 2011 'Draft Articles on the Effects of Armed Conflicts on Treaties', which is neither binding nor considered to state existing customary law (as would be the case with the ILC's 'Draft Articles on Responsibility of States for Internationally Wrongful Acts', for example), but assumes the position that could be tentatively determined as predominant at the moment, namely that "armed conflict does not *ipso facto* terminate or suspend the operation of treaties"[13]. In such cases, a logical next step when confronted with conflicting or competing rules would be to attempt finding a *lex specialis* relationship between them. *Sassòli*[14] gives a practical example of this with IHL and maritime safety law, and distinguishes whether a question is more linked with the actual hostilities and arises between belligerents (then IHL would prevail, with its rules on military necessity etc. which are specifically tailored to such situations), or a question merely arises during an armed conflict but is not strongly linked to the hostilities (then the other body of law will prevail, to the extent that it regulates the issue). I find this a useful approach to apply in the analysis of the intersections of outer space law and IHL which have not yet been examined in detail[15].

Once the applicable laws are determined, though, a number of further interpretation questions arise: How to interpret the general principles of IHL (discrimination, proportionality, responsibility, protection of certain categories of persons and assets, rules on targeting, etc.) in an entirely new operational domain? How should the standards developed for land, sea or air conflict be "transplanted" into outer space? Which IHL treaty provisions would apply directly to space

[10] One example would be Art. 38 of the Geneva Convention IV, which concerns protected persons on the territory of a state party to a conflict. This would mean that civilian astronauts from one side of a conflict are protected (also) by the rules of the 1968 Rescue Agreement when on the territory of the other side. But could it then mean – *e contrario* – that this is not the case while they are outside such territory, or any state's territory, as in outer space; or is this instead where only the Rescue Agreement applies by virtue of the case falling out of the scope of application of the Geneva Convention? This is one of the specific examples I intend to examine in the course of the research.

[11] "[t]he provisions of the present Convention shall not prejudge any question that may arise in regard to a treaty […] from the outbreak of hostilities between States", Art. 73 VCLT.

[12] E.g. in *United States Diplomatic and Consular Staff in Tehran (United States of America v. Iran)* (Judgement) [1980] ICJ Rep 3, or in the advisory opinion *Legality of the Threat or Use of Nuclear Weapons* [1996] ICJ Rep 226.

[13] ILC, 'Report of the International Law Commission Sixty-third Session' (26 April–3 June and 4 July–12 August 2011) UN Doc A/66/10, para. 100, Draft Article 3.

[14] Marco Sassòli, *International Humanitarian Law: Rules, Controversies, and Solutions to Problems Arising in Warfare* (Edward Elgar Publishing 2019) 484–485.

[15] For example, determining the interaction of IHL and the Liability Convention – this could provide reasonable basis for distinctions between objects damaged as military targets and accidental damages to civilian objects.

operations[16], and where would only the general principles and customary law be relevant? What is a space weapon? What could be a legitimate target in terms of IHL, especially considering dual-use space assets; what constitutes an armed attack? Is the North Atlantic Treaty now applicable too? What are the legal obligations towards private commercial actors in the case of conflict? What about the role of other treaties and that of "soft law"[17]? How far can we draw analogies from existing judicial decisions (as nothing directly related to space warfare has been adjudicated yet)?[18] Given that a whole new method of warfare, cyber warfare, has emerged, and it comes surrounded by even less legal certainty to pose its own specific set of problems, particularly the difficult attribution questions – would IHL apply to it at all and how[19]? Where do other emerging technologies (autonomous weapons, artificial intelligence, unmanned vehicles, etc.) come into play?

The future of technology ties into the next question:

2. What kinds of new rules concerning the weaponisation of outer space could be necessary and viable?

The classic framework of space law has given rise to unresolved, politically driven disputes on the term "peaceful use" of outer space where the interpretations range from "non-military" to "non-aggressive". Furthermore, that body of international law only bans the placement of weapons of mass destruction (WMDs) in outer space (Art. IV OST) and has nothing explicit to say on the deployment of ground-to-space ASATs, intercontinental ballistic missiles and hypersonic missiles, cyber attacks, jamming, laser weapons, intentional satellite collisions or the placement and use of conventional weapons in space, including missile defence systems.

One attempt to tackle legal lacunae, the 2008 (updated 2014) draft treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (PPWT), introduced by China and Russia at the UN Conference on Disarmament, has been

[16] For example, William Boothby, one of the most renowned experts on weapons law, holds that Art. 35 and Art. 36 of the 1977 Additional Protocol I to the Geneva Conventions of 12 August 1949 apply directly (for states parties to API) where new technologies are concerned, even though the originally intended scope of application did not envision space warfare at all. William H Boothby, *Weapons and the Law of Armed Conflict* (2nd edn, Oxford University Press 2016) 298.

[17] For example, the series of UNGA Resolutions from the 1981 Res 36/97[C] ('Prevention of an Arms Race in Outer Space', followed by yearly reaffirming resolutions with the same title until the current 2021 UNGA Res 76/22); the 2020 UNGA Res 75/37 ('No first placement of weapons in outer space'); the 2021 UNGA Res 76/230 ('Further practical measures for the prevention of an arms race in outer space'); the Tallinn Manual 2.0 on cyber operations and space law; the Hague Code of Conduct against ballistic missile proliferation, etc.

[18] As another example, one could ask the question if a satellite can be treated like an oil rig or a ship under the flag of a certain state. If the question is use of force or self-defence under the UN Charter, there are decisions like the ICJ's *Oil Platforms (Islamic Republic of Iran v. United States of America)* (Judgement) [2003] ICJ Rep 161, which could provide a metaphorical measuring tape – or could they?

[19] While there is a general consensus nowadays that international law does apply to cyberspace, a number of countries openly question the applicability of the rules on state responsibility and/or international humanitarian law.

consistently rejected by the U.S.; the situation concerning binding law seems to have poor prospects of change in the foreseeable future.

Similarly, "soft law" such as numerous UN Resolutions dating back to the 1960s, Codes of Conduct, transparency- and confidence-building measures, or measures aimed at curbing the arms race in outer space depend entirely on the goodwill of governments which may be primarily concerned with national defence interests, and, in the case of the U.S., China and Russia, can hardly be expected to easily find themselves on the same side in matters of international law.

Does that mean that the only way to regulate tensions could be a military deterrence strategy in the vein of the nuclear deterrence policies? What would it take for "proper" legal solutions to be accepted? If the major space powers remain at loggerheads with each other, are there any other paths to take? How meaningful is the EU's effort with its draft International Code of Conduct for Outer Space Activities[20], or the new concept of responsible behaviour in outer space with its idea to focus on behaviours rather than specific weapons[21]? What impact can we expect from non-binding instruments? While the first research question aims to examine the rules applicable in actual conflict, the goal of this second question is to look at the possible ways of preventing such conflict, discouraging hostilities or at least limiting the available means and methods of war.

Where appropriate, the thesis will also address definitional problems and why they matter, such as: (i) delimitation of outer space, (ii) peaceful use of outer space, (iii) military uses – weaponisation vs militarisation of space, (iv) use of force, (v) armed attack, (vi) collateral damage and proportionality, etc.

Further questions may include e.g. existing dispute resolution mechanisms and the necessity (or not) of a dedicated court or tribunal.

III.) Current State of Research

There is only a handful of recent dedicated publications on this topic. Several well-known authors from the area of outer space law have published articles, which identify the issue and generally agree on the applicability of IHL and related instruments in outer space, but these short contributions, being only articles and book sections, do not go into much detail or do so only on isolated subtopics, mostly limiting themselves to creating awareness of the problem and outlining

[20] International Code of Conduct for Outer Space Activities [Draft] (version 31 March 2014) <https://eeas.europa.eu/archives/docs/non-proliferation-and-disarmament/pdf/space_code_conduct_draft_vers_31-march-2014_en.pdf> accessed 21 May 2022.

[21] As expressed, most recently, in UNGA Res 75/36 'Reducing space threats through norms, rules and principles of responsible behaviours' (7 December 2021) UN Doc A/RES/75/36.

the framework and cornerstones of the issue. Those include most notably Frans von der Dunk[22], Steven Freeland[23], Jackson Maogoto[24], Cassandra Steer[25] and Dale Stephens[26]. There are also a few contributions by legal personnel with military background (such as Major Douglas Anderson[27] or Major Robert Ramey[28]), some focused contributions on the relationship of the OST and the UN Charter (Esparza[29], Lee[30]) and recent articles chancing a look at a possible future regulatory regime (Zhao and Jiang[31]), conflict scenarios (Idrovo Romo[32]), or a parallel with the development of rules on aerial warfare (Fernandez[33]).

There is another, older body of publications from the Cold War era, which is however largely outdated in view of the developments in both technology and international law (and usually rather politically charged), and therefore only of historical interest.

What stands out when examining the above listing is the lack of any longer, more comprehensive work on the topic. This is a part of the gap my research would aim towards filling. There is also no discussion of certain aspects at all (that I am aware of at the time of writing this exposé), for example the emerging state practice with respect to the national Space Forces, and the methodological diversity also appears somewhat limited (I am not aware of any work using the approach I propose below for my second research question).

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22 Frans von der Dunk, 'Armed Conflicts in Outer Space: Which Law Applies?' (2021) 97 International Law Studies 188.

23 Steven Freeland and Elise Gruttner, 'The Laws of War in Outer Space' in Kai-Uwe Schrogl (ed), Handbook of Space Security: Policies, Applications and Programs (2nd edn, Springer International Publishing 2020) and
Steven Freeland and Elise Gruttner, 'Critical Issues in the Regulation of Armed Conflict in Outer Space' in Suzannah Linton, Tim McCormack and Sandesh Sivakumaran (eds), *Asia-Pacific Perspectives on International Humanitarian Law* (1st edn, Cambridge University Press 2019) and
Freeland S and Jakhu RS, 'The Applicability of the United Nations Space Treaties during Armed Conflict' (2015) 58 International Institute of Space Law 157

24 Jackson Nyamuya Maogoto and Steven Freeland, 'The Final Frontier: The Laws of Armed Conflict and Space Warfare' [2007] SSRN Electronic Journal <http://www.ssrn.com/abstract=1079376> accessed 21 May 2022.

25 Cassandra Steer and Dale Stephens, 'International Humanitarian Law and Its Application in Outer Space' in Cassandra Steer and Dale Stephens, War and Peace in Outer Space: Law, Policy, and Ethics (Oxford University Press 2020).

26 Dale Stephens and Cassandra Steer, 'Conflicts in Space: International Humanitarian Law and Its Application to Space Warfare' (2015) XXXX McGill Annals of Air and Space Law <https://papers.ssrn.com/abstract=2722315> accessed 21 May 2022.

27 Douglas S Anderson, 'A Military Look Into Space: The Ultimate High Ground' [1995] Army Law.

28 Robert A Ramey, 'Armed Conflict on the Final Frontier: The Law of War in Space' (2000) 48 Air Force Law Review.

29 Ryan M Esparza, 'Event Horizon: Examining Military and Weaponization Issues in Space by Utilizing the Outer Space Treaty and the Law of Armed Conflict' 83 Journal of Air Law and Commerce 333.

30 Ricky J Lee, 'The Jus Ad Bellum in Spatialis: The Exact Content and Practical Implications of the Law on the Use of Force in Outer Space' (2003) 29 Journal of Space Law 93.

31 Yun Zhao and Shengli Jiang, 'Armed Conflict in Outer Space: Legal Concept, Practice and Future Regulatory Regime' (2019) 48 Space Policy 50.

32 Juan Felipe Idrovo Romo, 'Armed Conflicts in Outer Space: Applicability and Challenges of International Humanitarian Law' (2020) 7 USFQ Law Review 335.

33 Gemmo Bautista Fernandez, 'Where No War Has Gone before: Outer Space and the Adequacy of the Current Law of Armed Conflict' (2019) 43 Journal of Space Law 245.

The other relevant publications which would inform my research can be grouped in two categories: authors approaching the topic from a space law point of view, and authors writing from the humanitarian law corner.

From the space law side, there are more numerous publications assuming a wider perspective - not focused on the specific questions of armed conflict, but dealing with military uses of outer space in general – by well-known scholars in the area such as Setsuko Aoki[34], Francis Lyall and Paul Larsen[35], Fabio Tronchetti[36], Michael Schmitt[37] or Melissa de Zwart[38].

From the IHL corner, I would like to highlight the work of William H Boothby[39], who has been discussing for several years space weapons, targeting, and new technologies in IHL as a part of his authoritative books on those subjects.

There is also an entirely separate body of literature on cyber attacks and international law, as this topic has so far only found entry in publications dealing exclusively with the legal framework of cyberspace. Several handbooks include chapters discussing use of force[40], armed attack[41], the IHL principles of distinction[42] or proportionality[43] in cyberspace, and there are first monographs already, notably by Marco Roscini[44] on the use of force and by Heather Harrison Dinniss[45] on the laws of war in cyberspace, which will inform my research of the specificities of cyberattacks against space

[34] Setsuko Aoki, 'Law and Military Uses of Outer Space' in Ram S Jakhu and Paul Stephen Dempsey (eds), *Routledge Handbook of Space Law* (Routledge 2017).

[35] Francis Lyall and Paul B Larsen, *Space Law: A Treatise* (2nd edition, Routledge 2018).

[36] Fabio Tronchetti, 'Legal Aspects of the Military Uses of Outer Space' in Frans von der Dunk and Fabio Tronchetti (eds), *Handbook of Space Law* (Edward Elgar Publishing 2015).

[37] Michael N Schmitt, 'International Law and Military Operations in Space' in Armin von Bogdandy and Ruediger Wolfrum (eds), *Max Planck Yearbook of United Nations Law Vol. 10*, vol 10 (Brill 2006).

[38] Melissa de Zwart, 'International Space Law and Military Use of Space' (Social Science Research Network 2020) SSRN Scholarly Paper 3679675 <https://papers.ssrn.com/abstract=3679675> accessed 21 May 2022.

[39] William H Boothby, *The Law of Targeting* (Oxford University Press 2012); William H Boothby, *Conflict Law: The Influence of New Weapons Technology, Human Rights and Emerging Actors* (TMC Asser Press 2014); William H Boothby, *Weapons and the Law of Armed Conflict* (2nd edn, Oxford University Press 2016).

[40] Marco Roscini, 'Cyber Operations as a Use of Force' in Nicholas Tsagourias and Russell Buchan (eds), Research Handbook on International Law and Cyberspace (Edward Elgar Publishing 2021).

[41] David Turns, 'Cyber War and the Concept of "Attack" in International Humanitarian Law' in Dan Saxon (ed), International Humanitarian Law and the Changing Technology of War (Brill Nijhoff 2013).

[42] Karine Bannelier, 'Is the Principle of Distinction Still Relevant in Cyberwarfare? From Doctrinal Discourse to States Practice' in Nicholas Tsagourias and Russell Buchan (eds), Research Handbook on International Law and Cyberspace (Edward Elgar Publishing 2021).

[43] Michael A Newton, 'Proportionality and Precautions in Cyber Attacks' in Dan Saxon (ed), International Humanitarian Law and the Changing Technology of War (Brill Nijhoff 2013).

[44] Marco Roscini, *Cyber Operations and the Use of Force in International Law* (Oxford University Press 2014).

[45] Heather Harrison Dinniss, *Cyber Warfare and the Laws of War* (Cambridge University Press 2012).

assets. The discussion of such attacks is still in its infancy, with a few authors writing under the label of "cyber security" of space assets (Beyza Unal[46], Salvador Llopis Sanchez[47], Stefano Zatti[48]).

Finally, it should be noted that other bodies of literature concerning militarisation / weaponisation and outer space exist too, namely in the technical / engineering / astrophysics area or from the sphere of political science, but will have to remain outside the scope of this research project.

IV.) Methodology

In terms of methods, my first research question is a classic doctrinal question and the search for answers will utilise the classic methods of legal interpretation: grammatical, systematic, teleological and historical interpretation, as well as some comparative analysis and analogy[49]. In this part, the thesis will analyse international treaties and customary international law as its main primary sources, but also judicial decisions, the growing ecosystem of "soft law" instruments (e.g. UN Resolutions, manuals, non-binding declarations of states, Codes of Conduct, etc.) and, naturally, secondary literature. Certain national policy documents (such as defence white papers) will also be analysed as far as they are a testimony to legal views and also in support of factual statements. I also have a particular interest in analysing national military manuals (of the above-mentioned Space Forces) as evidence of state practice (and potentially *opinio iuris*).

For the second research question, which is a normative question, I will likely take a utilitarian stance, because I currently stand with the observation that it is a "mark of the practical realism of international law that the fact of war is accepted and the pragmatic focus of the law is directed at seeking to alleviate its worst consequences"[50], and I would like to avoid looking through the prism of overly optimistic expectations of frictionless and peaceful international cooperation (or the classically philosophical discussion of moral and ethical issues regarding armed conflict). One such pragmatic approach would be to examine possible solutions and existing initiatives through the theoretical lens of Law and Economics. The essential work by *Posner* and *Sykes*[51] provides tools for assessing under what conditions new international treaties are viable options or what alternatives

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46 Beyza Unal, *Cybersecurity of NATO's Space-Based Strategic Assets* (Chatham House – The Royal Institute of International Affairs 2019) <https://www.chathamhouse.org/sites/default/files/2019-06-27-Space-Cybersecurity-2.pdf> accessed 19 May 2022.

47 Salvador Llopis Sanchez and others, 'Cybersecurity Space Operation Center: Countering Cyber Threats in the Space Domain' in Kai-Uwe Schrogl (ed), Handbook of Space Security: Policies, Applications and Programs (2nd edn, Springer International Publishing 2020).

48 Stefano Zatti, 'Space and Cyber Threats' in Kai-Uwe Schrogl (ed), Handbook of Space Security: Policies, Applications and Programs (2nd edn, Springer International Publishing 2020).

49 For this question, I believe my perspective would tend to adhere to the legal positivist tradition.

50 William H Boothby, *Weapons and the Law of Armed Conflict* (2nd edn, Oxford University Press 2016) 1.

51 Eric A Posner and AO Sykes, *Economic Foundations of International Law* (Belknap Press of Harvard University Press 2013).

may be successful, operating under the premise that states are rational actors which will act according to national interests as they consider the costs and benefits of certain behaviours. This appears to me especially fitting when such a fundamental interest as national security is the focus of the national decision-makers. For example, *Posner* and *Sykes* provide a very logical explanation why a ban on certain weapons may fail: because the proposed treaty lacks symmetry, i.e. it does not fulfil the condition to give advantage to neither side in a conflict[52]. However, the relative gains of a rule may be hard to identify or may vary between belligerents, which leads to more complex patterns of behaviour[53]. Additionally, the concept of reciprocity, which is the condition for self-enforcing laws of war[54] - "both states exercise self- restraint so that they have a way of retaliating if the other state fails to follow the rules"[55] - would explain the reluctance of some states to accept the application of IHL to certain scenarios (e.g. cyber attacks): if there is no attack, there is no power to retaliate, and therefore no reciprocity, *ergo* no self-enforcing law that either side needs to take into account.

The overarching debate on the general effectiveness of international law is not the focus of this thesis, but it cannot be entirely disregarded either, especially in view of the fact that there are changing attitudes towards classic international law, shifts in bargaining powers on the international arena and new theoretical approaches that some see in the state practice (and possibly advancement of new *opinio iuris*) especially from the two strongest contenders among the emerging spacefaring nations, China and India[56]. A brief review of that debate would provide another angle to the question what future solutions are viable and/or likelier to gain wider acceptance.

To complete a sort of triangulation on the problem, I am considering the use of *Lindgren*'s[57] tool for assessing compliance with international space law and norms to establish which instruments have a higher tendency for acceptance.

Concerning further research methods, I plan to attempt reaching out to legal advisors of armed forces and relevant international bodies (such as COPUOS, NATO, the PAROS Committee) for interviews to direct me to other declassified information sources.

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52 ibid 192.
53 ibid 193.
54 ibid.
55 ibid 194.
56 Fozia Lone, 'Cross-Fertilization of Westphalian Approaches to International Law: Third World Studies and a New Era of International Law Scholarship' (2020) 34 Emory International Law Review 955, 980.
57 David Lindgren, *An Assessment Framework for Compliance with International Space Law and Norms: Promoting Equitable Access and Use of Space for Emerging Actors* (Springer International Publishing 2020).

In my research of primary and secondary literature, I am currently using the physical and digital offers and research tools of the University of Vienna libraries and a number of online databases (e.g. of the UN and the ICRC or the US Congress) and other libraries (e.g. the Peace Palace Library). The body of secondary literature on my topic is still relatively small and quite highly cross-referenced between publications, which allows for a relatively quick acquisition of a reasonable overview through the "snowball system".

Finally, the ongoing work of two academic projects dealing with similar research questions, the MILAMOS Project (McGill University, Canada) and the Woomera Manual (University of Adelaide, Australia) will be continuously and closely observed; should they produce any finalised results before the completion of the thesis, these would be examined in detail.

V.) Significance of the Proposed Research

The very existence of these projects, as well as that of the new Space Forces and weapons capabilities, demonstrates that there is a need for answers at this new intersection of international law. My proposed research would strive to contribute towards filling that gap and developing the understanding of an actively evolving issue. I believe the topic I have in view is particularly timely considering the current international developments and not deeply explored in academic writing yet, and the significance of tackling yet-unanswered questions is evident. I also wish to underline one more time that this topic is not "science fiction" or a theoretical exercise of purely academic interest – it is a case of current, existing technology seemingly outpacing the law, but even arms races and armed conflict do not and cannot exist in a space free of rules and regulations. Therefore it is of paramount importance to attempt locating and identifying these rules, also in view of mitigating the potentially devastating effects of future conflicts (or at least the means and methods of conducting them).

As a short final example, the destroyed satellite in the Russian ASAT test on 15 November 2021 created over 1,500 trackable pieces of space debris which threatened the lives of astronauts aboard the International Space Station as well as the integrity of other satellites and space operations, and affected negatively all nations' free access to space[58]. If there were no clear rules for the much graver situation of targeted attacks against other countries' space assets, there would be only a low threshold to cross before conflicts with uncontrollable and unpredictable results – much more so than historical wars – can flare up.

[58] Idrees Ali and Steve Gorman, 'Russian Anti-satellite Missile Test Endangers Space Station Crew – NASA' (*Reuters*, 16 November 2021) <https://www.reuters.com/world/us-military-reports-debris-generating-event-outer-space-2021-11-15/> accessed 21 May 2022.

B.) Preliminary Table of Contents of the Dissertation

** The structure may change in the course of the research*

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C.) Preliminary Bibliography

I.) Primary Sources

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