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**WAR AND PEACE IN OUTER SPACE:
LAW, POLICY, AND ETHICS**

**EDITED BY CASSANDRA STEER AND MATTHEW HERSCH
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With recent media coverage of Virgin Galactic¹ and Blue Origin² launching tourists into suborbital space, and SpaceX³ launching an all-civilian crew into Earth's orbit, one might be forgiven for thinking that outer space is the playground of billionaires and their space companies. While there can be no doubt that these launches are entertaining for many people, this is not the full story of what is currently happening in space nor who all the significant space actors competing for launch windows and orbits actually are.

In the past few years, there has been an increase in the number of dedicated space forces and space commands being added to militaries around the world.⁴ The creation of the United States Space Force even inspired its own satirical Netflix series.⁵ While this might give the impression that military space activities are something relatively new, this is far from the case. Space activities have always involved military and

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¹ Jonathan Amos, 'Virgin Galactic: Sir Richard Branson Rockets to the Edge of Space', *BBC News* (online, 11 July 2021) <<https://www.bbc.com/news/science-environment-57797297>>.

² Richard Luscombe, 'Jeff Bezos Hails "Best Day Ever" after Successful Blue Origin Space Flight', *The Guardian* (online, 21 July 2021) <<https://www.theguardian.com/technology/2021/jul/20/blue-origin-launch-jeff-bezos-space-travel-latest>>.

³ Kenneth Chang, 'Inspiration4 Astronauts Beam after Return from 3-Day Journey to Orbit', *The New York Times* (online, 18 September 2021) <<https://www.nytimes.com/2021/09/18/science/spacex-inspiration4.html>>.

⁴ The United States became the first State to do so with the establishment of the United States Space Force on 20 December 2019: 'About the United States Space Force', *United States Space Force* (Web Page) <<https://www.spaceforce.mil/About-Us/About-Space-Force/>>.

⁵ *Space Force* (Netflix, 2020) <<https://www.netflix.com/au/title/81021929>>.

government actors.⁶ As Lieutenant General David D Thompson of the United States Space Force notes, ‘[t]he space domain has been an area of human competition and potential conflict since the dawn of the Space Age more than 60 years ago’.⁷ Indeed, the Australian Department of Defence has explicitly recognised space as ‘both an essential enabler of military operations and a warfighting domain in its own right’.⁸ While there are those who protest against the militarisation of space,⁹ the majority of scholarship in this area takes a more pragmatic approach, working with the reality of military activities in space and seeking to find ways to reduce the risks and consequences of war in space.

A new book, *War and Peace in Outer Space: Law, Policy, and Ethics*, is one such contribution, tackling as it does some of the challenges inherent in space as a military domain.¹⁰ Taking an interdisciplinary approach, the book brings together chapters covering a wide range of perspectives — including legal, ethical, policy-based, and diplomatic — on topics related to military activities in outer space, in times of war and times of peace (as the title suggests). The book has its origins in a conference held in 2018 on the use of military force and cooperation in space at the University of Pennsylvania’s Centre for Ethics and the Rule of Law.¹¹ While a majority of the papers are drawn from presentations at that conference, additional authors have been carefully selected by the editors in order to balance what would otherwise have been a very Western-centric collection.

As the editors note in their introductory chapter:

Efforts to use space technology and the space environment to attack and to defend against attack have been present from the earliest experiments in spaceflight, yet spacefaring nations have traditionally approached the subject of warfare in space with judicious concern. A theater of battle unlike any other, the space environment, especially in Earth orbit, imposes demands on combatants and risks to combatants and noncombatants alike, that challenge diplomats, policymakers, and military leaders in profound ways.¹²

⁶ See generally Melissa de Zwart and Dale Stephens, ‘The Space (Innovation) Race: The Inevitable Relationship between Military Technology and Innovation’ (2019) 20(1) *Melbourne Journal of International Law* 1.

⁷ David D Thompson, ‘Foreword’ in Cassandra Steer and Matthew Hersch (eds), *War and Peace in Outer Space: Law, Policy, and Ethics* (Oxford University Press, 2021) vii.

⁸ Australian Government Department of Defence, *Annual Report 19–20* (Report, 2020) 96 <https://www.defence.gov.au/annualreports/19-20/DAR_2019-20_Complete.pdf>.

⁹ See, eg, Ram S Jakhu, Kuan-Wei Chen and Bayar Goswami, ‘Threats to Peaceful Purposes of Outer Space: Politics and Law’ (2020) 18(1) *Astropolitics* 22.

¹⁰ Cassandra Steer and Matthew Hersch (eds) (n 7).

¹¹ Matthew Hersch and Cassandra Steer, ‘Introduction: Why Space Law Matters in War and Peace’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 1, 1 (‘Introduction’).

¹² *Ibid.*

These challenges are not going to quietly disappear, and as space becomes more competitive, the risk of increased tensions is only likely to rise. The chapters in this book explore and seek to provide answers to some of the most challenging issues arising in connection with military activities in space. The book is divided into four parts, taking the reader progressively through: the general legal framework (Part I: The Law of War and Peace in Space); ethical issues (Part II: The Ethics of Space Security); specific threats to space security (Part III: Current and Future Threats to Space Security); and proposed legal and diplomatic solutions (Part IV: Toward Stability).

This is not a book about how to fight a war in space, although there is a chapter devoted to the application of the laws of war to space.¹³ Instead, the focus of the majority of the chapters in the collection is on how to reduce the risk of conflicts escalating into a war in space. In Part I, Theresa Hitchens observes that

norms and transparency and confidence-building measures (TCBMs) often serve as essential foundations to allow States to avoid misunderstandings, miscalculations, and conflict escalation by laying out ‘rules of the road’ for interactions and activities in the international sphere.¹⁴

Rather than relying on existing space law treaties and non-binding instruments to ensure peaceful uses of space, Ichō Kealotswe-Matlou calls for the establishment of an Independent Outer Space Authority ‘that regulates outer space activities [and] would provide a reliable and solid foundation for verification and enforcement of international obligations’.¹⁵

In Part II, the focus of the chapters turns to ethics and the ethical obligation to avoid taking part in escalatory behaviour, adding a unique perspective to the previous chapters that solely discussed the law. Space ethics is a highly specialised field of ethics research ‘concerned with examining the idea that just because we can do certain things in space, it doesn’t mean we should’.¹⁶ If there is one criticism that could be made of this Part, it is that none of the contributing authors appear to be a space ethicist. Nonetheless, the treatment of the ethical issues and the ethical lens given to these chapters by their respective authors provide a valuable addition to the collection. PJ Blount argues that

throughout the Outer Space Treaty the drafters used aspirational norms to add an ethical dimension to the law of outer space. For instance, while the Article I

¹³ Cassandra Steer and Dale Stephens, ‘International Humanitarian Law and Its Application in Outer Space’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 23.

¹⁴ Theresa Hitchens, ‘Norm Setting and Transparency and Confidence-Building in Space Governance’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 55, 56.

¹⁵ Ichō Kealotswe-Matlou, ‘The Rule of Law in Outer Space: A Call for an International Outer Space Authority’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 91, 102.

¹⁶ ‘Space Ethics: Ethically Navigating the Next Frontier’, *University of New South Wales: Canberra* (Web Page) <<https://unsw.adfa.edu.au/our-research/space-ethics>>.

provision that the use and exploration of outer space shall be ‘the province of all mankind’ is ambiguous in meaning, it serves to link space activities to the goals and aspirations of humanity rather than a single State. ... [S]uch linking does not create specific legal obligations, but rather colors hard obligations of the Outer Space Treaty with humanist notions prevalent in the still emerging post-1945 international law regime. ... It is through these types of provisions that space law imbues not just obligations but also ethical values that States are meant to consider as they engage in space activities.¹⁷

The application of ethical values to the military use of outer space, and specifically US space dominance, is the subject of the final chapter in this Part. Joan Johnson-Freese and Kenneth Smith observe that views in relation to military uses of space range from the belief that space is an inevitable warfighting domain, to the belief that space should only be used for peaceful purposes.¹⁸ However, as the authors argue in their chapter, the latter view is simply untenable due to the dual-use nature of most space technology and the multiple competing interpretations of peaceful purposes by different States and scholars. The authors note that

with ethics analyses, disagreements between informed debaters can be distilled to differing definitions of justice, rights, common good, and well-being ... A principled ethics analysis, however, can act as a guidepost during situations that seem to have no ‘good’ options.¹⁹

Part III contains chapters outlining threats to space security, current as well as forward-looking issues and challenges. Topics in this Part include the United States Space Force and its remit,²⁰ arms control,²¹ zones,²² and space hybrid operations.²³ Two chapters of note in this Part relate to the challenges of arms control in space and the creation of zones to exclude others. Jinyuan Su observes that the greatest challenge to preventing an arms race in outer space is the absence of a definition of what amounts to a weapon in space, as even inherently benign technology can be repurposed to capture or disable an adversary’s space asset.²⁴ Su concludes his chapter by challenging the

¹⁷ PJ Blount, ‘Peaceful Purposes for the Benefit of All Mankind: The Ethical Foundations of Space Security’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 109, 109.

¹⁸ Joan Johnson-Freese and Kenneth Smith, ‘US Space Dominance: An Ethics Lens’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 123.

¹⁹ Ibid 148.

²⁰ Peter L Hays, ‘What Should the Space Force Do? Insights from Spacepower Analogies, Doctrine, and Culture’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 153.

²¹ Jinyuan Su, ‘The Legal Challenge of Arms Control in Space’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 181.

²² Matthew Stubbs, ‘The Legality of Keep-Out, Operational, and Safety Zones in Outer Space’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 201.

²³ Jana Robinson, ‘Prominent Security Risks Stemming from Space Hybrid Operations’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 229.

²⁴ Su (n 21) 191.

international community, in particular major spacefaring countries ... [to] think more broadly about international peace and security rather than their unilateral security interests, especially given our mutual dependencies on a sustainable and stable space environment.²⁵

This would be a welcome approach by major spacefaring States, although sadly it is unlikely to eventuate in the current environment which seems to be very much one of competitiveness between States and a desire to dominate the space domain. In a forward-looking chapter, Matthew Stubbs observes that ‘there are a variety of situations where it will be in the strategic (or even merely commercial) interests of a State to seek to prevent other States from accessing an area of outer space’.²⁶ After considering the legality of different types of zones in space and how this might be balanced with one of the fundamental principles of space law — that space is free for exploration and use by all — Stubbs concludes that States can legally declare keep-out and operational zones in space in limited instances, and predicts that this will be an area where the practice of States will shape the development and implementation of the law in the future.²⁷ The issue of zones in space has become an increasingly important topic in recent years with plans for space resource utilisation (or space mining) and with the release of the Artemis Accords.²⁸ This chapter provides a thoughtful contribution to scholarship in this area.

In the final Part (Part IV), the contributions focus on possible solutions to the issues and challenges raised in the previous Parts ‘in order to avoid a space-based conflict in which there are no winners’.²⁹ Gilles Doucet proposes a multilateral treaty that could act as a transparency and confidence building measure, contributing to arms control in space by requiring States to notify and report any activity that results in the transfer of energy to any object in Earth orbit.³⁰ Doucet argues that adopting such a measure ‘would make it more difficult for States to develop antisatellite weapons and also, more importantly, reduce their perceived need for such capability’.³¹ Noting that the space domain presents distinct challenges for crisis management and the potential for heightened global and regional tensions to draw States into a conflict, Laura Grego utilises a crisis stability lens to evaluate space security — ‘the avoidance of incentives to strike first, reducing the risks of misinterpretation and miscalculation, and increasing resilience to incipient crises, allowing them to be resolved as

²⁵ Ibid 199.

²⁶ Stubbs (n 22) 201.

²⁷ Ibid 227.

²⁸ ‘The Artemis Accords: Principles for a Safe, Peaceful, and Prosperous Future’, *National Aeronautics and Space Administration* (Presentation) <https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords_v7_print.pdf>.

²⁹ Hersch and Steer, ‘Introduction’ (n 11) 17.

³⁰ Gilles Doucet, ‘A Proposed Transparency Measure as a Step toward Space Arms Control’ in Cassandra Steer and Matthew Hersch (eds) (n 7) 247, 254.

³¹ Ibid 248.

quickly and nonviolently as possible'.³² In the final chapter in this Part, Paul Meyer laments the decline in diplomacy and the consideration of diplomatic options in the approaches of States to space security.³³ Meyer argues that the greatest

threat to the future exploitation of outer space resides in the potential for the 'peaceful purposes' of the Outer Space Treaty regime to be challenged by States intent on extending earthly conflict into this environment and, by means of 'weaponization,' transform it into just another domain for 'warfighting'. It is my contention that such a challenge is beginning to be mounted by leading space powers, and unless countervailing diplomatic efforts are made to preserve the special, pacific legal regime established for outer space half a century ago, we could witness a rapid degradation of this vital (if vulnerable) environment at great loss for humanity. A revival of diplomatic activism on behalf of space security is required, not only by concerned States but also on the part of the wider stakeholder community, including the private sector and civil society that benefit from the current regime.³⁴

Meyer submits that a return to diplomacy can 'realign the depiction of outer space as a realm of promising international cooperation rather than one of inevitable confrontation and conflict'.³⁵ States would do well to heed this call and reflect on the solutions proposed in this Part of the collection.

Cassandra Steer and Matthew Hersch conclude the collection with a suggestion that

[i]n order to counter the problems of 'congestion, contestation and competition' in space, we need to focus on 'cooperation, collaboration, and communication,' which should be held as paramount by State actors and private actors as we continue to be more and more dependent on space technologies and space operations. This includes capacity-building both nationally and internationally.³⁶

The editors have done well to include a wide range of perspectives in this book and should be commended for their obvious efforts to achieve gender balance in contributing authors. The result is a carefully curated collection of chapters which will be of interest to students, academics, policy makers, and those operating in the space domain. This collection is timely, provides a valuable contribution to efforts to establish agreed norms of behaviour in space, and goes a long way in answering many of the urgent questions facing the space domain.

³² Laura Grego, 'Outer Space and Crisis Risk' in Cassandra Steer and Matthew Hersch (eds) (n 7) 265, 270.

³³ Paul Meyer, 'Diplomacy: The Missing Ingredient in Space Security' in Cassandra Steer and Matthew Hersch (eds) (n 7) 287.

³⁴ *Ibid* 288.

³⁵ *Ibid* 300.

³⁶ Cassandra Steer and Matthew Hersch, 'Conclusion: Cooperation, Collaboration, and Communication in Space' in Cassandra Steer and Matthew Hersch (eds) (n 7) 301, 303.