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Australia as a Space Norm Entrepreneur

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Abstract

The unrestrained development of anti-satellite capabilities threatens Australia's continued access to space. Drawing on Australia's history of promoting the norm of nuclear non-proliferation, this essay outlines the role Australia and the Australian Defence Force can play in promoting norms limiting the weaponisation of space to ensure unrestricted access to this domain for all.

Introduction

Australia's 2020 *Defence Strategic Update* states that 'assured access to space is critical to the Australian Defence Force's (ADF) warfighting effectiveness, situational awareness and the delivery of real-time communications and information' (Department of Defence, 2020, p. 38). Australia's uninhibited use of space is increasingly threatened by the unconstrained testing and development of sophisticated anti-satellite (ASAT) weapons and dual-use technology. These capabilities are inadequately constrained by existing international laws and the norms that comprise the outer space regime (OSR). The inadequacy of the current regime endangers Australia's continued access to this domain because it is insufficient to prevent the proliferation of orbital debris, either because of testing or the intentional use of ASAT capabilities.

This essay posits that by acting as a norm entrepreneur, Australia can play a critical role in addressing this issue by promoting a norm restricting the testing, development and use of kinetic ASAT weapons. Beginning with an examination of the ADF use of the space domain, it explores the threat that kinetic and non-kinetic ASAT weapons and dual-use technologies pose to the safety of all space users. It argues that the current OSR's international laws and norms inadequately prevent nations from pursuing activities that may render space unusable due to the proliferation of orbital debris resulting from continued testing or the intentional use of ASAT capabilities.

This essay explores the role Australia can play as a norm entrepreneur to limit the growing weaponisation of space. Drawing on Australia's experience promoting the norm of nuclear non-proliferation, it argues that Australia can again play a critical role in ensuring the peaceful use of space by promoting norms limiting the testing, development and use of kinetic ASAT capabilities. It contends that while championing this norm, Australia should avoid pursuing a kinetic ASAT capability and instead focus on projects that enhance its own sovereign space capability. This approach will provide strategic benefits to Australia while also signalling its commitment to the peaceful use of space. Ultimately, Australia's efforts will make outer space accessible for all users.

Threats to the use of space

Space is a critical enabler for ADF operations across all domains. Satellites are responsible for providing globe-spanning Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) capabilities to forces operating in land, sea and air domains (Kleinberg, 2007). The *Air-Space Integration: AFDN 1-19* doctrine note articulates the importance of space to the ADF, noting that the 'ADF way of warfighting critically depends on space' (The Air Power Development Centre, 2019, p. 56). In addition to providing a force multiplier by enhancing combatant lethality and reducing casualties, satellites have profoundly influenced how many modern nations fight. Berg (2011, p. 31) contends that satellite-enabled technology, such as precision-guided munitions (PGM), has fundamentally reshaped contemporary warfare. Leveraging the capacity of satellites to provide position, navigation and timing (PNT) services, PGMs have become integral to modern warfighting because of their ability to achieve the high accuracy and certainty in targeting necessary to comply with the principles of discrimination and proportionality that underpin *jus in bello*.

Although satellites provide significant tactical and strategic benefits, the reliance on space-based capabilities has created an 'Achilles' heel' in modern militaries. Nations have sought to advance their own capabilities and nullify their opponents' through the development of counterspace technology. This has taken the form of kinetic direct ascent anti-satellite (DA-ASAT) missiles—non-kinetic systems employing uplink/downlink jamming, cyberattacks and laser-dazzling—and co-orbital ASAT vehicles capable of independently manoeuvring and interfering with other satellites (Harrison et al., 2017). In addition to the tactical implications arising from the immediate loss of satellite capability, these technologies also have the potential to cause significant second- and third-order collateral effects through the creation of considerable quantities of orbital space debris. This debris can travel at speeds of up to 15 km/s in Low Earth Orbit (LEO) and present a major hazard to orbital vehicles. At this speed, objects as small as 1 cm have enough velocity to cause mission-critical damage to satellites, and objects as small as 10 cm can cause catastrophic disintegration of entire platforms on impact (European Space Agency, n.d.-a). Notably, the destruction of a single satellite has the potential to cause a cascading chain reaction known as the Kessler Syndrome. This event, proposed by NASA scientist Donald Kessler in 1978, describes a scenario where a series of collisions result in debris proliferating to the extent that entire orbital regions of space become unusable.

Despite the hazards posed by the space debris that DA-ASAT weapons produce, the testing and development of such capabilities have continued unabated. China's destruction of a defunct weather satellite in 2007 marked the first test of a DA-ASAT weapon since the Cold War. This event created a debris field comprising over 3,000 trackable objects and was assessed to have doubled the amount of debris in space at the time (National Aeronautics and Space Administration [NASA], 2008, p. 2). More recently, Russia's successful test of a DA-ASAT missile against its Soviet-era Kosmos 1408 satellite on 15 November 2021 created more than 1,500 trackable pieces of space debris in addition to potentially 'hundreds of thousands of pieces of smaller [untrackable] orbital debris' (Rajagopalan, 2021, p. 2). The use of non-kinetic or co-orbital ASAT technology does not necessarily obviate the risk of creating space debris. While non-kinetic ASAT capabilities may avoid immediately creating debris when neutralising orbital vehicles, this does not prevent the uncontrolled satellite from later creating debris after colliding with other objects in space. This possibility was highlighted in 2009 following the unintentional collision between defunct Russian satellite Kosmos 2251 and their active satellite Iridium 33. This event generated close to 2,000 pieces of trackable debris, an amount that equated to 14% of the total number of catalogued objects residing in or traversing LEO at the time (NASA, 2011, p. 10). With no current means of effectively capturing or removing space debris, the European Space Agency notes that the population of large and massive objects has reached a critical density in LEO, with an unavoidable collision between a satellite and debris projected to occur at least once every decade (European Space Agency, n.d.-b).

The continued development of both kinetic and non-kinetic ASAT capabilities jeopardises the safe access to space for all nations. The current regime regulating the use of space is inadequate for controlling the proliferation and testing of ASAT weapons or preventing the hostile use of benign satellite capabilities. This presents a threat for all space users and increases the likelihood of an ablative space event occurring because of a misunderstanding or continued testing.

Outer space regime (OSR)

A regime can be defined as the 'principles, norms, rules, and decision-making procedures' that set the expected behaviours in relation to a given issue (Krasner, 1982, p. 185). The foundations of the current OSR are drawn from the 1967 *Outer Space Treaty* (OST). The OST, drafted at the height of the Cold War Space Race, aimed to ensure that 'outer space and celestial bodies were reserved exclusively for peaceful purposes' and to 'avoid the extension of present rivalries' among Cold War nations (OST, 1967). Despite its age, a number of articles have had enduring relevance. Article IV prohibits the placing of nuclear weapons and weapons of mass destruction (WMD) in space. It also bans the placement of military bases, the conduct of military exercises and the testing of weapons on celestial bodies (OST, 1967). Article IX compels states to consider the activities of other states when conducting exploration or use of outer space, and avoid harmful interference with the activities of other nations (OST, 1967).

The OST's continued relevance to space in the 21st century has been questioned. Johnson argues that it is important to consider that the OST was a product of the Cold War when space technology was nascent, and the priority for international lawmakers was preventing a nuclear space war over competition in space (Johnson, 2018, p. 1). While the OST has achieved its objective of preventing the placement and testing of WMDs in space, it has failed to stop nations from continuing to test and develop ASAT capabilities using conventional weapons. The UN General Assembly has attempted to address this through additional resolutions but has achieved limited success. The 1981 *Prevention of an Arms Race in Outer Space Resolution*, which calls on states to 'contribute to the peaceful use of outer space, prevent an arms race there, and refrain from actions contrary to that objective', is non-binding and has not gained universal support (Mehdi & Su, 2020). Attempts by countries such as China and Russia to convince other nations to commit to a 'No First Placement' of weapons in space policy have also received a similarly lukewarm reception. This is because unilateral statements, unlike UN resolutions, have the potential to become binding under international law and have received significant opposition from states who see deterrence through DA-ASAT capabilities as the only means of effectively safeguarding their orbital assets (United Nations, 2006, p. 370). Moreover, as the following example illustrates, there is inconsistency in defining 'space interference' or what constitutes a weapon in space. This has provided nations such as Russia, who have made these commitments, with a loophole to escape punishment.

A number of recent examples highlight the dangerous trajectory of space weaponisation and further underscore the inadequacy of the current OSR in ensuring the peaceful use of space. In July 2020, Russian satellite Kosmos 2543 fired a small projectile near another Russian satellite in a test. This avoided contravening Article IV of the OST on a technicality because the weapon was not tested on a celestial body, nor was the projectile a weapon of mass destruction (Wright, 2020). Despite this, US Space Command condemned the event as indicative of Russia testing its capability to deploy co-orbital ASAT weapons in space, a move that ran contrary to Russia's 'No First Placement' commitment (Vorontsov, 2021). In a similar vein, advances in dual-use satellite technology have resulted in satellite capabilities that could potentially violate Article IX's non-interference principle of the OST. China's Tianjin University recently developed a new robot designed to support space debris-removal missions. Harrison et al. (2021, p. 10) observe that the robotic arm design could, in theory, be used to grab an adversary's satellite, concluding that this feature 'lends itself to a co-orbital ASAT, even if that is not the stated intent'. This issue is further complicated by advances in technology that

enable satellites to conduct close rendezvous and proximity operations (RPO), raising the potential for non-contact interference. This issue was recently highlighted in January 2020, when Russian satellite Kosmos 2542 was observed to manoeuvre itself into a position that would enable it to potentially monitor a US KH-11 spy satellite. Commander US Space Force General John Raymond observed that this manoeuvring could be nothing more than practising on-orbit manoeuvres, but it could also be an attempt to intercept communications, a clearly hostile move (Hennigan, 2020). While modern space vehicles are being developed to perform legitimate operations such as monitoring, repair and refuelling, their potential for hostile interference is clear.

Frustration over the pace of the international community addressing these issues has led to a number of non-government initiatives to independently codify the applicability of international law to the military use of outer space (Pobjie, 2021, p. 3). Projects such as the *Woomera Manual on the International Law of Military Space Activities* ('Woomera Manual'; University of Adelaide, 2018) and the *Manual on International Law Applicable to Military Uses of Outer Space* (MILAMOS; McGill Centre for Research in Air and Space Law, 2016) seek to improve the OSR by identifying and articulating the relevant existing international law, rather than developing new laws (Brown & Funnell, 2020). These manuals will create a more regulated, rules-based space environment by developing a set of norms and standards of behaviour for spacefaring nations while holding to the cardinal principle of using space for peaceful purposes, similar in approach to the *HPCR Manual on International Law Applicable to Air and Missile Warfare* (Program on Humanitarian Policy and Conflict Research at Harvard University, 2013) and the *Tallinn Manual on International Law Applicable to Cyber Warfare* (Schmitt, 2013).

Australia's history of norm entrepreneurship

Carr (2012, p. 41) defines norm entrepreneurship as actors who 'frame the current state of affairs as unacceptable, diagnose the causes, and offer their alternate norm as a remedy'. Australia's success as a norm entrepreneur in promoting the non-proliferation of WMDs from 1983 onwards demonstrates the Australian Government's potential to improve the OSR by advocating for restrictions on the testing and development of kinetic ASAT capabilities. Australia's development of a sovereign space capability demonstrates its willingness to contribute to space as an active user and global citizen while also expanding a number of strategic capabilities the ADF can leverage across the full spectrum of future operations.

Hanson (1999, p. 14) opines that Australia's approach to norm entrepreneurship since 1983 has been through 'participation in the processes of negotiation and the formulation and upholding of international rules and norms'. Australia has had a disproportionately significant contribution to encouraging its adoption relative to its standing as a military power. Cooper (2002, p. 186) describes Australia as acting 'pragmatically and opportunistically', reframing the problem in response to the changing issues at the time to socialise non-proliferation as the optimal solution. The Howard Government achieved considerable success in promoting non-proliferation to the international community by highlighting the danger of non-state nuclear terrorism, reframing the issue as a security challenge rather than a diplomatic one in the wake of the 2001 September 11 attacks.

Australia has also shown its commitment to norm promotion through funding projects that benefit the wider international community. Australia demonstrated the advantages arising from its geographic location in the Indo-Pacific as a means of providing a test-monitoring service in an unmonitored region. In supporting the *Comprehensive Nuclear-Test-Ban Treaty* (CTBT), Australia built 16 of the 20 facilities used in the CTBT's monitoring scheme. In 2009, Australia's CTBT stations helped detect nuclear tests in North Korea, demonstrating the value of Australia's involvement in the treaty promoting the norm of non-proliferation (Comprehensive Nuclear-Test-Ban Treaty Organization, 2018). Australia can leverage similar advantages when advocating for norms limiting the test and usage of ASAT weapons.

Promoting a new norm

Australia can make significant contributions to the development of a more-relevant OSR by promoting norms limiting the test and development of kinetic ASAT capabilities. In addition to leveraging its international influence in the region to promote this norm, Australia can continue to develop its own sovereign space capabilities to better prepare it for future conflict. Doing so will also demonstrate its position as an active contributor to space endeavours and commitment to space use for peaceful purposes.

Handmer (2018, p. 2) argues that Australia is uniquely positioned to act as a regional space norm entrepreneur because of its strong history of international scientific cooperation, good relations with many of the major corporations in the space industry and geographic proximity to rising powers in Asia. Davis (2019, p. 28) avers that Australia should play a full and visible role in promoting international engagement, championing normative and legal measures that erode the view that international security relies on possessing better counterspace capabilities. To achieve this, Australia must adopt a similarly pragmatic approach to the regulation of space as it did on the issue of nuclear arms control. Rather than calling on nations to abandon ASAT capabilities entirely, it must advocate limits on the testing, development and use of overtly offensive capabilities such as kinetic DA-ASAT and co-orbital weapons. As the Howard Government's experience of nuclear disarmament illustrates, Australia should recognise that nations will not commit to the complete surrender of ASAT capabilities. Nevertheless, Australia can still make significant contributions to ensuring a safer OSR for all users by advocating the limitation of ASAT testing, development and stockpiling.

This stance will not be without risks. Even if other nations refuse to commit to a no-use or no-test policy on kinetic ASAT weapons, Australia must agree to unilaterally avoid developing such a capability as it did with WMDs. Although this approach creates a potential strategic vulnerability, Davis (2019, p. 33) contends that this is necessary as the development of an overt Australian offensive kinetic ASAT capability would run counter to Australia's professed support for norms that seek to promote a peaceful space domain. Australia could mitigate against this threat by building a more disaggregated space force. Davis (2021, p. 3) suggests that the ADF can increase its resilience by diversifying essential space services over many satellites and focusing on developing a sovereign rapid-launch and recovery capability. The ADF can also consider enhancing non-kinetic satellite countermeasures and electronic warfare, thereby minimising debris and avoiding contravening the norms that Australia seeks to promote. Therefore, Australia can guard against a future commitment against the employment of ASAT weapons and still ameliorate the effects of their use.

Even if Australia is forced to eschew any potential DA-ASAT capability, it can continue to make a practical contribution to Allied security in space by focusing on capabilities that provide benefits to partner nations. Paralleling Australia's test-monitoring project under the CTBT as part of its broader efforts towards WMD non-proliferation, it can focus on supporting projects that assist in enforcing the norm of limiting kinetic DA-ASAT test and development or contribute to the overall safety of space. Australia can achieve this through the development of space-based situational awareness capabilities such as JP9360, which will provide Australia with a sovereign space-based space domain awareness network. In addition to providing a means of tracking man-made and natural objects in space, JP9360 will also assist the enforcement of norms restricting the use and testing of DA-ASAT technology by providing a threat warning and attribution capability (Pittaway, 2021). While providing a strategic effect, the development of an indigenous space capability through projects such as JP9360 and JP92102 (the development of a sovereign satellite communications constellation) will enhance Australia's position as a space norm entrepreneur by signalling its commitment and relevance. Cook (2007, p. 9) avers that 'to lend greater credibility to its right to contribute to the debate on the OSR, Australia must demonstrate its ability to contribute in a meaningful way'. Australia's 1980s attempt to promote restrictions on nuclear weapons as a non-nuclear country demonstrates that it must earn its place at the negotiating table by showcasing its own adherence to the norms it promotes.

Conclusion

Despite international treaties regulating the weaponisation of outer space, this domain has become increasingly contested, congested and competitive and shows no signs of changing. This paper has argued that the current OSR cannot ensure the ADF's unconstrained access to space or the continued use of space for purely peaceful means by the international community. It has demonstrated that Australia can leverage its history as a norm entrepreneur to promote behaviours limiting the test and use of kinetic ASAT weapons among nations. In addition to projects such as JP9360 and JP92102, Australia should continue developing a more resilient space presence by building a numerous and diverse range of satellite capabilities. Doing this not only provides strategic benefit to the ADF but also demonstrates a commitment to space by supporting efforts to make this domain safer for all through the tracking of orbital debris. Australia can then assist in developing an OSR that ensures the peaceful use of space.

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