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BALLISTIC MISSILE DEFENCE & OUTER SPACE SECURITY

A STRATEGIC INTERDEPENDENCE

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ACRONYMS & ABBREVIATIONS

ABM	anti-ballistic missile
ASAT	anti-satellite weapon
CD	Conference on Disarmament
GGE	Group of Governmental Experts
TCBMs	transparency and confidence-building measures

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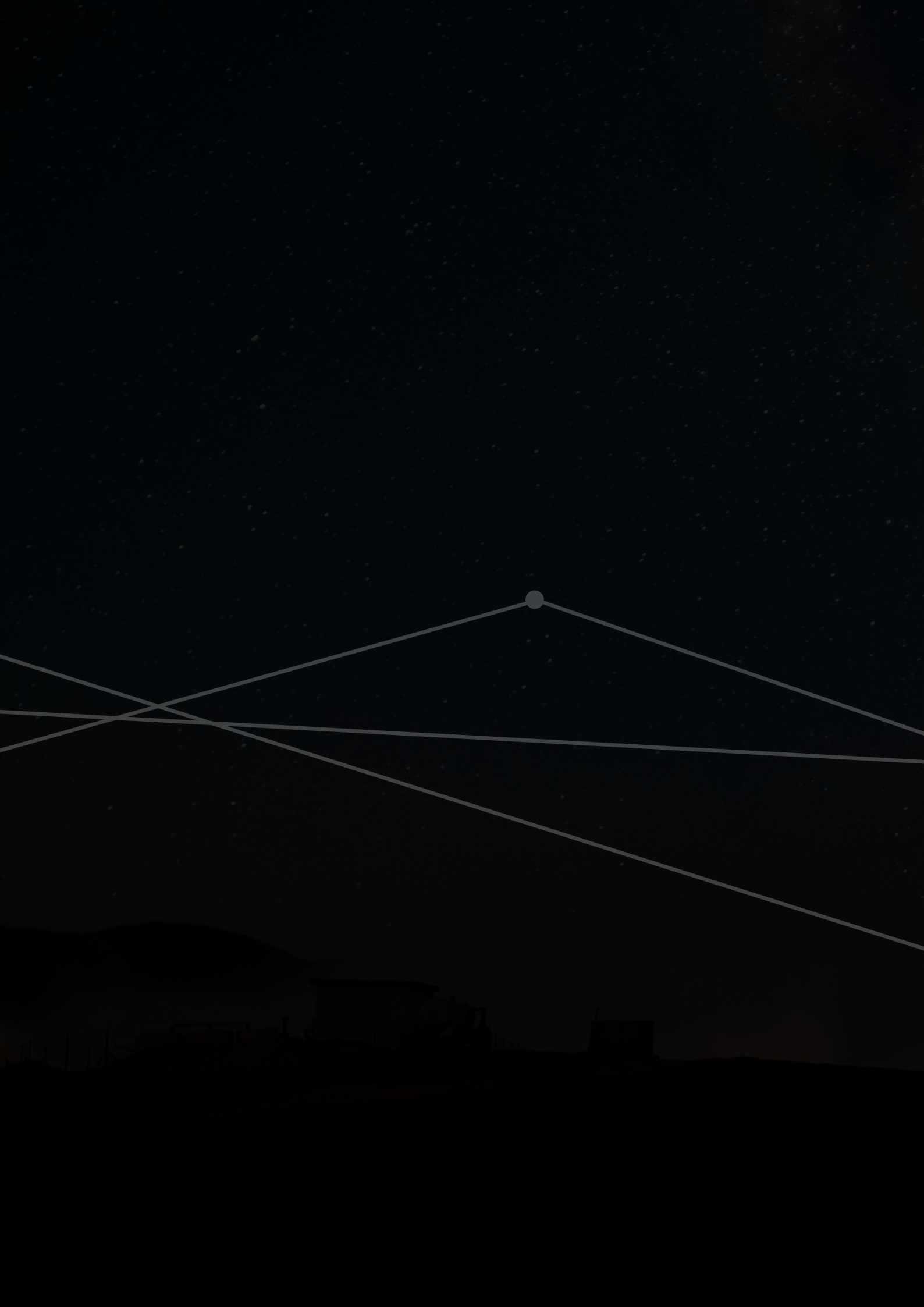
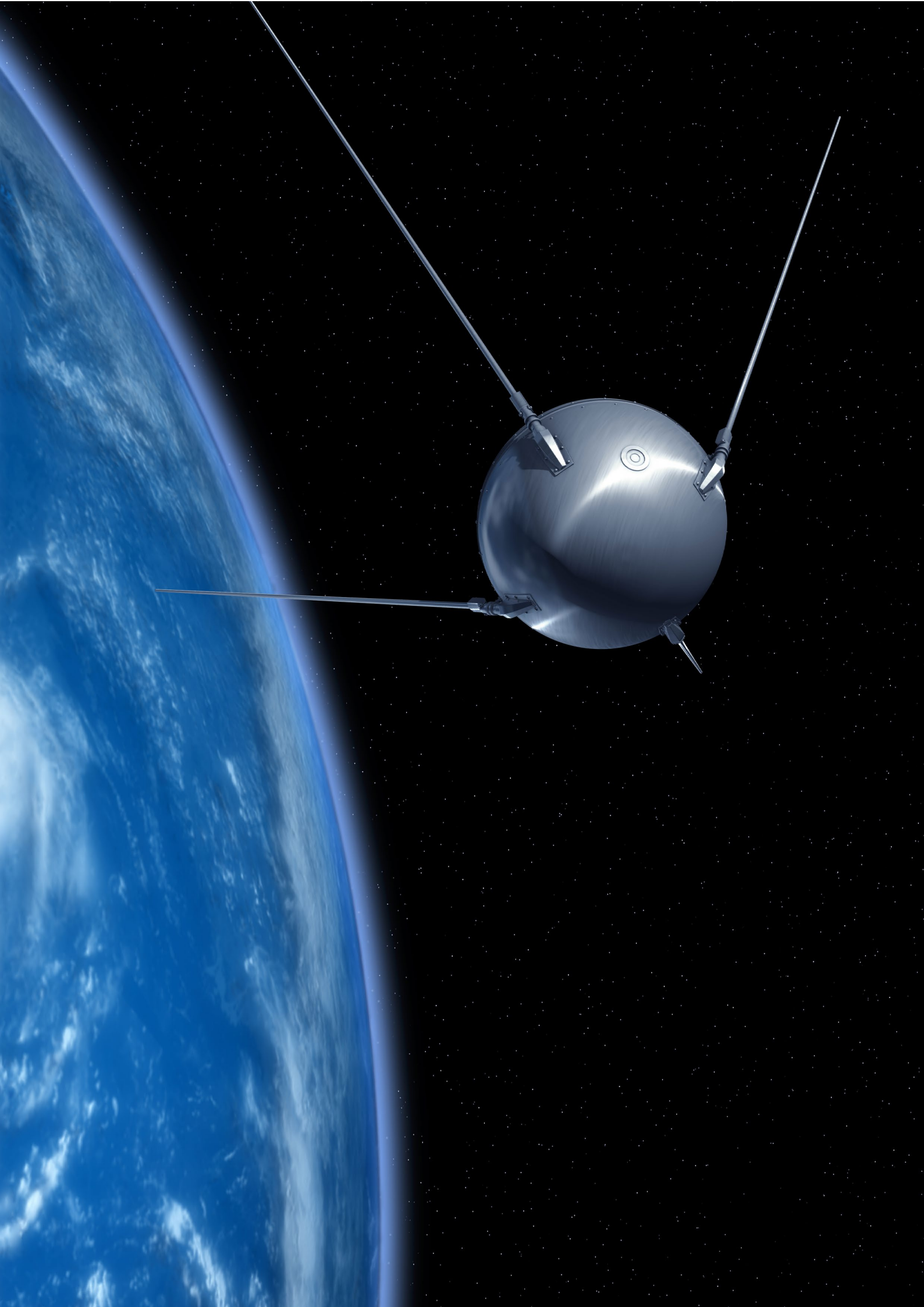


KEY TAKEAWAYS

» The development of policies and capabilities relating to space security and ballistic missile defence have been intertwined in a tense relationship that threatens 'strategic stability'.

» International cooperation on space security has always been paralleled by efforts to gain military advantage in this ultimate 'high ground'.

» Diplomatic options for cooperative security arrangements exist but they require State champions if they are going to be able to progress.



1. INTRODUCTION

Ever since the dawn of the Space Age with the launch of Sputnik in 1957, States have displayed two contrasting approaches when it comes to how this vast realm should be employed. On one hand, there has been a vision of space as a 'global commons', a 'sanctuary' from the strife that has been a chronic feature of Earthly existence. The exploration of outer space offered an opportunity for humanity to turn a new chapter and promote international cooperation rather than confrontation in this unique environment. On the other hand, space has also from the beginning been viewed as "the ultimate high ground"[1] the use of which could provide any capable State with great strategic advantage over its adversaries, perceived or real. As will be seen, this means there is an intrinsic link between the use of space and considerations of strategic stability and competition on Earth, including for missile defence systems, offensive nuclear forces, and advanced long-range conventional systems including those designed to manoeuvre at hypersonic speeds.

This bifurcation of approach to outer space was manifested by the conduct of the United States and the Soviet Union, the only two powers at the dawn of the Space Age with the ability to launch spacecraft. These two 'superpowers' were leaders of respective opposing alliances that vied for supremacy throughout the Cold War. They were also the possessors of ever-expanding nuclear weapon arsenals and relied on policies of nuclear deterrence and joint vulnerability to mutual assured destruction (the apt acronym MAD) to maintain a 'strategic balance' and prevent war.

This underlying strategic relationship informed their policies of both parties towards ballistic missile defence and outer space security. Developments in these areas would have major implications for the viability of the strategic balance that both sides wished to secure. The inter-relationship between missile defence and space security would be one of continual 'strategic tension'. This relationship would also become more acute and complicated as other spacefaring States developed these capabilities with potential disruptive consequences for retaining a benign environment in outer space.

This paper will examine the complex evolution of the missile defence–space security relationship via a chronological analysis covering the following key periods: the dawn of the Space Age (1957); the Outer Space Treaty (1967); the Anti-Ballistic Missile Treaty (1972); the Strategic Defense Initiative and the Prevention of an Arms Race in Outer Space (1982); the abrogation of the Anti-Ballistic Missile Treaty (2002); and the revival of anti-satellite weapons (2007). Following those sections contemporary diplomatic options are explored, before closing with conclusions and recommendations.

1 An early use of this term appears in a 1997 US Air Force Space Command publication entitled "The High Frontier".

2. THE DAWN OF THE SPACE AGE

It is usual to date the advent of the Space Age with the launch by the Soviet Union of Sputnik 1 in October 1957, but this was the culmination of a decades-long effort to develop rockets for military purposes. The capacity of Soviet intercontinental ballistic missiles to lift the heavy payload associated with early atomic warheads with the range to reach the United States (and hence counter the advantage that the United States possessed in long-range bombers) provided the basis for its successful space launch vehicles.[2]

Although entering somewhat later to the rocket enterprise, the United States was also intent on exploiting the military potential of space. By 1954, the United States Air Force initiated a satellite reconnaissance programme that was characterized as a "vital strategic interest" and which was aimed at the "acquisition of photo-intelligence on Soviet airfields and missile sites".[3] At the same time, the National Security Council kept a wary eye on Soviet activities, in 1955 projecting the near-term launch of a military satellite by the Soviet Union. The Council argued for the development of a 'civilian' satellite, albeit under the US Navy, to beat the Soviets to this achievement. It is noteworthy that the Council in bolstering its argument for the satellite noted that it would provide information "clearly relevant to missile and anti-missile research".[4]

The shock of Sputnik was more of a political and public nature as the Soviet programme was well known to the US national security establishment. Nevertheless, it had real world consequences in terms of public perception as to a scientific and technological defeat the United States has suffered at the hands of the Soviet Union. In the Cold War context, it spurred US responses, including an early initiative (put forward by the US Ambassador to the United Nations on 10 October, less than a week after Sputnik) at the General Assembly to conclude an agreement on pre-launch inspection of all space rockets to ensure their 'peaceful intentions'. Given the Soviet lead in space launch capability, it is perhaps not surprising that Moscow expressed no interest in the US proposal.[5]

The mutual interest in the superior reconnaissance capabilities that satellites would offer led to a common approach regarding the legal status to be applied to outer space. As the principle of sovereign control of airspace was impracticable to apply to orbiting spacecraft, the rival powers agreed on a different formula. As one account has described it: "Although each was initially worried that the other might claim national jurisdiction in order to deny the legality of satellite overflight, as they assertively did in the case of airspace, both instead endorsed the principle that sovereign jurisdiction cannot be extended to space".[6]

2 Anatoly Zak, "The R-7 intercontinental ballistic missile", Russian Space Web, http://www.russianspaceweb.com/r7.html.
3 James Clay Moltz, *The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests*, 2011, p. 87.
4 Ibid.
5 Ibid., pp. 92–93.
6 Nancy Gallagher and John D. Steinbruner, "*Reconsidering the Rules for Space Security*," American Academy of Arts and Sciences, Reconsidering the rules of space project, 2008, p. 4.

WASHINGTON DC, USA 1967
Soviet Ambassador Anatoly F. Dobrynin, UK Ambassador Sir Patrick Dean, US Ambassador Arthur J. Goldberg, US Secretary of State Dean Rusk, and US President Lyndon B. Johnson at the signing of the Outer Space Treaty on January 27, 1967 in Washington DC.

3. THE OUTER SPACE TREATY

The common motivation of the United States and Soviet Union to access outer space and enable surveillance of the Earth unfettered by claims of sovereignty provided the impetus for developing a legal regime for outer space that seemed premised on international cooperation. In an early effort to gain legitimacy for this schema, the United States and Soviet Union supported a series of resolutions which were unanimously adopted by the General Assembly. Most significant were "International Cooperation in the Peaceful Uses of Outer Space" (resolution 1802, December 1961), "General and Complete Disarmament" (resolution 1884, October 1963) and "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space" (resolution 1962, December 1963). Although not legally binding, these resolutions set out such key principles as no national appropriation through claims of sovereignty, the prohibition on orbiting weapons of mass destruction, and the peaceful use of space.[7]

Behind this movement to define outer space as a domain for cooperation rather than conflict lay the more pragmatic conclusions from some ill-fated efforts to exploit space for military advantage, specifically for potential ballistic missile defence. Most notable among them was the Starfish Prime test of July 1962 when the United States exploded a 1.4 megaton nuclear weapon in space as part of an examination of the potential of nuclear explosions to destroy ballistic missiles. The electromagnetic pulse (EMP) resulting from the explosion far surpassed prior estimates and resulted in the disabling of at least six satellites, including one British and one Soviet.[8] This debacle added to rising concerns in the scientific community about the environmental effects of nuclear explosions/EMP, US recognition of damage to its telecommunication satellites, and the threat radiation might pose to human space flight. Together, these factors contributed to a shift under US President Kennedy and Soviet Premier Khrushchev away from space weaponization towards other forms of both competition and cooperation.

On the competitive side, the 1962 Cuban Missile Crisis led the two leaders to confront the nuclear abyss. In the aftermath of the crisis, cooperation was prompted in the form of the first arms control agreements, notably the Partial Test Ban Treaty of 1963, which banned nuclear explosions in outer space. The cooperative impetus enabled the negotiation of the first legally binding agreement governing the new realm: the Outer Space Treaty of 1967. The treaty is one of the great accomplishments of multilateral security diplomacy. With 109 States Parties, the treaty enshrined in international law a unique status for outer space as a 'global commons' ("a province of all mankind" in the less gender sensitive terminology of the time) in which no claim of sovereignty or national appropriation would be allowed. The treaty specified that activity in outer space should be for "peaceful purposes" and "for the benefit and in the interests of all countries". This peaceful orientation was reinforced by a prohibition on stationing weapons of mass destruction in outer space as well as on any militarization of the Moon and other celestial bodies. The treaty is filled with references to international cooperation with provisions for observations of space launches, reciprocal visits to installations

7 For a detailed account of the gestation of the resolutions and their legal status, see Karen Tranmuller, "The 'Declaration of the Legal Principles Governing the Activities of States in the Exploration of Outer Space': The Starting Point for the United Nations Law of Outer Space", in Irmgard Marboe (ed.), *Soft Law in Outer Space*, 2012.

8 James Clay Moltz, *The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests*, 2011, p. 119.

MOSCOW 1972
President Richard Nixon and Soviet Communist Party leader Leonid Brezhnev afix their signatures to the SALT agreement on May 26, 1972 in Moscow.

in space, reporting to the public and the international scientific community on the results of space activity and the celebration of astronauts as "envoys of mankind".[9]

The Outer Space Treaty, for all its continuing importance, did suffer from at least two major omissions. First, it provided no follow-up mechanism, specifically no provision for meetings of States Parties (a standard feature of contemporary multilateral treaties). Secondly, it did not extend its prohibition on weapons of mass destruction to other forms of weaponry, which would have been in keeping with its goal of preserving outer space for peaceful purposes.

9 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, entered into force 10 October 1967, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html.

4. THE ANTI-BALLISTIC TREATY

Ballistic missile defences (which aim at intercepting incoming missiles) were one of these other forms of weaponry not addressed by the Outer Space Treaty.[10] The outer space–ballistic missile defence nexus became salient again for the superpowers with the advent of the first strategic arms control negotiations at the end of the 1960s. The domestic political controversies around the deployment of the US Safeguard anti-ballistic missile (ABM) system in 1969 and the attendant concern in both Washington and Moscow as to the potential for the introductions of ABM systems to fuel a further build-up of offensive nuclear systems prompted a diplomatic initiative to negotiate controls on such systems. These negotiations eventually led in 1972 to the ABM Treaty and SALT I, with the former being of indefinite duration. The ABM Treaty drastically limited ABM systems (to two locations each with a ceiling of 100 interceptors—subsequently reduced to one location). Most importantly for space security, the treaty prohibited the two parties from developing any space-based ABM system. A cooperative approach to space-based surveillance for verification of compliance with the new strategic agreements was also incorporated in SALT I via the provision for non-interference with national technical means, a euphemism for the reconnaissance satellites both sides were now deploying. In the words of one observer, "This accomplishment was of major significance for arms control in assuring verification and was of political significance as well".[11]

10 See "US Missile Defense", Union of Concerned Scientists, https://www.ucsusa.org/nuclear-weapons/missile-defense.
11 Raymond L. Garthoff, *Détente and Confrontation: American–Soviet Relations from Nixon to Reagan*, 1985, p. 189; Garthoff provides a detailed account of the strategic arms control negotiations, including what he saw as a missed opportunity to incorporate an ASAT ban into the ABM Treaty; see pp. 133–192.

5. STRATEGIC DEFENSE INITIATIVE & THE PREVENTION OF AN ARMS RACE IN OUTER SPACE

Whatever stability in the bilateral strategic relationship that the arms control agreements had brought in their wake was suddenly disrupted in the spring of 1983. In a speech in March of that year US President Reagan outlined a new initiative for strategic defence premised on the deployment in space of hundreds of interceptors.[12] Almost instantly dubbed 'Star Wars', Reagan believed he was offering a way out of the dilemma posed by nuclear deterrence and the doctrine of mutual assured destruction. For most strategic experts, however, the US scheme was viewed as destabilizing. As an analyst described it: "Instead of keeping the peace through reliance on offensive weapons that threatened catastrophic destruction and possible global suicide, the [United States] would deter Soviet attack with an impenetrable defense. To many however, [Reagan's] proposal promised to lead only to the militarization of space and a surge in the arms race".[13]

Disquiet over programmes that threatened weaponization of space had already been expressed in the Final Document of the Tenth Special Session of the General Assembly (the first special session devoted to disarmament) in 1978 and was rendered concrete in 1981 when an item on "The Prevention of an Arms Race in Outer Space" (PAROS) was added to the agenda of the General Assembly. The Soviet Union presented at the same time a draft treaty prohibiting the placement of weapons in outer space. While the addition and a direction to the Conference on Disarmament (CD) to negotiate an international agreement on PAROS was supported, there were clear differences among States as to the scope of this envisaged agreement, with the allies of the blocs lining up behind the preferences of their respective leaders. The resolution sponsored by the Western Europe and Others Group wanted the CD to negotiate "an effective and verifiable agreement to prohibit anti-satellite systems".[14] The resolution sponsored by the Eastern European States sought an agreement that would prohibit the stationing of weapons of any kind in outer space.[15] Although the neutral and non-aligned States argued for combining the two resolutions into one to avoid sending mixed messages to the CD, this approach was rejected by the respective lead sponsors and both resolutions ended up being adopted by the General Assembly.[16]

Subsequent action by the CD, which placed PAROS on its own agenda in 1982, was never able to overcome the differences between the Western and Eastern camps. Not only was the scope of the agreement in contention throughout, the West also wanted to keep the mandate of the Ad Hoc Committee on PAROS, which was

12 President Ronald Reagan, Address to the Nation on Defence and National Security, 23 March 1983, http://www.atomicarchive.com/Docs/Missile/Starwars.shtml.
13 Strobe Talbott, *Deadly Gambits*, 1985, pp. 317–318.
14 UN Yearbook, 1981, p. 81, https://www.unmultimedia.org/searchers/yearbook/page.jsp?volume=1981&page=92.
15 UN Yearbook, 1981, pp. 80–81, https://www.unmultimedia.org/searchers/yearbook/page.jsp?volume=1981&page=92.
16 See UN Handbook, 1981, pp. 80–84, https://www.unmultimedia.org/searchers/yearbook/page.jsp?volume=1981&page=92.

established in 1985, as one of discussion rather than negotiation.

The Ad Hoc Committee met annually until 1994 and did provide a platform for discussions on relevant issues such as terminology and confidence-building measures, but it was never able to produce an agreement. In the view of the **Group of 21** and Eastern States as well as China it was necessary to plug the 'gap' in the Outer Space Treaty that allowed for weaponization of space.[17] The development of ballistic missile defence was seen as exacerbating that risk, as "given the similarities of requisite technology, the unrestrained development of ballistic missile defences could lead to development of ASAT weapons".[18]

Despite the disagreements and limited output of the CD, the declaratory policy of the international community regarding PAROS found consistent expression through an annual resolution on the subject adopted by the General Assembly from 1981, the language of which has not substantially changed to the present day.[19] This resolution clearly sets out the key objectives of the Member States as regards outer space security. It asserts that "further measures should be examined in the search for effective and verifiable bilateral and multilateral agreements in order to prevent an arms race in outer space, including the weaponization of outer space". After reaffirming "the importance and urgency" of preventing such an arms race, the resolution notes "that the legal regime applicable to outer space by itself does not guarantee the prevention of an arms race in outer space", and "that there is a need to consolidate and reinforce that regime and enhance its effectiveness".[20]

The General Assembly's PAROS resolution receives near universal support from States each year. At the General Assembly session in 2019 it was adopted by a vote of 183 to 2 (the United States and Israel), and no abstentions. In 2018, signalling a hardening of its position, the United States shifted to a 'no' vote after a decade of only registering an abstention on the resolution.[21] While the dissent of the leading space power detracts from the power of the PAROS resolution, its consistent strong support over the decades suggests that, at least at the level of declaratory policy, the international community wants to see further action on PAROS and the weaponization of space and considers the current legal regime of the Outer Space Treaty insufficient to ensure this goal.

In parallel with the increase of diplomatic attention to space security throughout the 1980s, both the US and Soviet militaries continued development and testing of anti-satellite weapons (ASAT). The Soviet Union developed a co-orbital weapon that would destroy its target satellite with a conventional explosion. This system was declared operational in 1973 and was further refined with testing in the 1976–1982 period. In 1984, the United States initiated testing of its 'Air-Launched Miniature Vehicle', a two-stage missile launched from an aircraft designed to destroy satellites with a direct impact. A test in October 1985 against an aging satellite at 555 km altitude produced significant amounts of persistent space debris and contributed to a US Congressional decision in December of that year to ban further testing. The Air Force discontinued the programme in 1987. With the spectre

17 Conference on Disarmament, *Report of the Ad Hoc Committee on Prevention of an Arms Race in Outer Space*, document CD/1271, 24 August 1994, §12, https://documents-dds-ny.un.org/doc/UNDOC/GEN/G94/639/71/IMG/G9463971.pdf?OpenElement.

18 For an account of the CD's handling of the PAROS item, see Paul Meyer, "The CD and PAROS: A Short History", UNIDIR, April 2011.

19 Compare A/RES/36/97C Prevention of an Arms Race in Outer Space, 9 December 1981, and A/Res/74/32 Prevention of an arms race in outer space, 12 December 2019.

20 UN General Assembly Resolution Prevention of an arms race in outer space, A/RES/74/32, 18 December 2019.

21 Explanation of Votes in the First Committee on Resolutions L.3: "Prevention of an Arms Race in Outer Space" and L.68/Rev.1: "Transparency and Confidence-Building Measures in Outer Space Activities", Remarks by Cynthia Plath Deputy Permanent Representative to the Conference on Disarmament, United Nations, New York City, November 6, 2018, https://geneva.usmission.gov/2018/11/07/eov-in-the-first-committee-on-resolutions-l-3-prevention-of-an-arms-race-in-outer-space-and-l-68-rev-1-transparency-and-conf/.

of the Strategic Defense Initiative in the background, the Soviet Union announced in 1983 a unilateral moratorium on ASAT tests as well as reviving its proposal for an agreement banning space-based weapons. As one analyst has summed up developments in this period, "both the United States and Soviet Union appeared to be hedging their bets by engaging in anti-satellite arms control talks while also pursuing anti-satellite technology (albeit at a low level)".[22]

22 Laura Grego, A History of Anti-Satellite Programs, Union of Concern Scientists, January 2011, p. 4.


TUNISIA
KUWAIT
MOROCCO
BAHRAIN
LIBYA
ALAYSIA

6. THE ABROGATION OF THE ABM TREATY

Arguably the most important action for the future course of 'strategic stability' taken in this century was the United States' withdrawal from the ABM Treaty in June 2002. The Bush Administration, in its quest to pursue national missile defence without constraints, decided that its 'supreme national interest' required it to abrogate the ABM Treaty. With its demise went the prohibition on space-based ABM systems and thus one of the only legally binding constraints on the weaponization of space. The nightmare of Soviet/Russian strategic thinkers now loomed large: unrestrained ballistic missile defence coupled with the weaponization of outer space. The Russian Federation was not in a strong position to contest these developments, but it emphasized then (and consistently to the present) that it could not countenance further reductions in strategic nuclear forces unless these two threats were addressed.[23]

The demise of the ABM Treaty prompted an immediate diplomatic effort by the Russian Federation and China (the latter's policy of No First Use and minimal nuclear forces meant that US expansion of ballistic missile defences was of special concern to Beijing) to counter the impact of this action on space security and strategic stability.

At the end of June 2002 (the very month the US withdrawal from the ABM Treaty became effective), the two States submitted a working paper to the CD entitled "Possible Elements for a Future International Legal Agreement on the Prevention of the Deployment of Weapons in Outer Space, The Threat or use of Force Against Outer Space Objects".[24] Core commitments under this envisaged agreement were "Not to place in orbit around the Earth any objects carrying any kinds of weapons, not to install such weapons on celestial bodies, or not to station such weapons in outer space in any other manner", and "Not to resort to the threat or use of force against outer space objects".[25] This working paper was the first iteration of what would become a draft treaty text that would be presented at the CD in 2008.

The atmosphere for devising diplomatic arrangements to counter the threat of space weaponization, however, had become less conducive under the Bush Administration, which took an increasingly jaded view of the merits of arms control in outer space. Representative of this stance was the statement by the US delegation delivered to a plenary of the CD in June 2006. The statement affirmed that, "The Cold War is over, Mr. President, and there is no arms race in outer space. Thus, there is no—repeat, no—problem in outer space for arms control to solve".[26]

23 For a recent iteration of this stance see Vladimir Yermakov, Head of Delegation, Russian Federation, Statement to the UN General Assembly First Committee General Debate, October 11, 2019.
24 CD/1679 China and Russia: Possible Elements of the Future International Legal Instrument on the Prevention of Deployment of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects, 28 June 2002, https://documents-dds-ny.un.org/doc/UNDOC/GEN/G02/624/84/PDF/G0262484.pdf?OpenElement.
25 Ibid.
26 Statement of the Delegation of the United States of America to the Conference on Disarmament, 13 June 2006, https://www.reachingcriticalwill.org/images/documents/Disarmament-fora/cd/2006/statements/13JuneUS.pdf

7. THE REVIVAL OF ANTI-SATELLITE WEAPONS

While the international community had become habituated to the continued jostling between the United States and the Soviet Union/Russian Federation in the realm of space security, it was taken by surprise in January 2007 by the actions of a third party. China had covertly conducted a 'kinetic kill' (i.e. direct strike) ASAT test against one of its defunct satellites using a direct-ascent missile. Undertaken at a high altitude (865 km) this destructive test created some 2,600 pieces of trackable debris, the majority of which will remain in orbit for approximately 40 years.[27] Although conducted under a public health rationale, the United States carried out a similar destructive ASAT operation the following year using an Aegis ship-based Standard Missile-3 BMD interceptor. The test, undertaken while the target satellite was at a low altitude (240 km, thus ensuring rapid de-orbiting of most associated debris), effectively demonstrated the inherent ASAT capability of its midcourse missile defense systems.[28] It should be noted that the only adaptation necessary to the Aegis missile used in this instance was a software upgrade, with no modifications to the physical integrity or design of the interceptor itself.[29]

The significance of these actions for reviving concerns regarding the space debris problem and the threat of armed conflict in outer space cannot be overstated. What had seemed to have been a danger effectively buried for a quarter of a century by the two superpowers, acting with a self-restraint born out of recognition of a mutual security risk, now emerged from the grave in a new and ugly form. As one seasoned observer put it, "China's test of an anti-satellite weapon (ASAT) in January 2007 marked the first violation of a tacit norm of no destructive ASAT testing in place since the US test in 1985. Not only did this event threaten a now much more crowded space environment with considerable new debris (adding almost 10 percent to the number of trackable objects), but it risked starting a cascade of testing by others. The US destruction of an errant intelligence satellite the following year (albeit in a much lower orbit) "further strained past norms of restraint." [30]

If some may have hoped that this resumption of destructive ASAT testing might be constrained after the initial tit-for-tat actions by China and the United States, these hopes were upended a decade later by India conducting a destructive ASAT test in March 2019. Far from keeping a low profile, Prime Minister Modi (who was engaged in a re-election campaign) trumpeted this achievement as an indication of India's great power status. Conducted at a low altitude (just below 300 km) to minimize the amount of long-lived orbital debris, it did not however yield the

27 James Clay Moltz, *The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests*, Stanford Security Studies, 2011, p. 53.
28 Col. Jay Raymond, 21st Space Wing Commander, "Operations Group Blazes New Trail during Operation Burnt Frost", 11 March 2008, https://www.peterson.af.mil/News/Article/328607/operations-group-blazes-new-trail-during-operation-burnt-frost/.
29 Brian Weeden and Victoria Samson, "Global Counterspace Capabilities: An Open Source Assessment", Secure World Foundation, 2019, pp. 3-8, https://swfound.org/media/206408/swf_global_counterspace_april2019_web.pdf.
30 James Clay Moltz, *The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests*, Stanford Security Studies 2011, p. 261.

zero debris result that India suggested.[31] The official press release justified the action as a way "to verify that India has the capability to safeguard our space assets", but went on to say that "We are against the weaponization of Outer Space and support international efforts to reinforce the safety and security of space-based assets".[32]

The 2019 Indian ASAT test is only the most recent prominent example of a growing trend among the leading spacefaring powers to develop counterspace capabilities with the potential for military application. In addition to the direct-ascent missiles used in an ASAT mode discussed so far, other counterspace capabilities include co-orbital systems, lasers and other directed energy systems, electronic warfare and cyber operations.[33] Investments in research and development of these non-destructive systems reflect the general concern over the debris problem, but not to the extent of abandoning the physically destructive systems. In its comprehensive open-source assessment, the US NGO Secure World Foundation concludes, "The evidence shows significant research and development of a broad range of kinetic (i.e. destructive) and non-kinetic counterspace capabilities in multiple countries. However, only non-kinetic capabilities are actively being used in current military operations". The assessment however also asserts that "Today there are increased incentives for development, and potential use, of offensive counterspace capabilities".[34]

The context for space security has experienced a relative shift towards more overtly conflictual threat perceptions and postures. France, India, Japan, and even NATO have recently announced policy changes highlighting outer space as a realm of military importance.[35] This trend has been particularly salient in the United States with the Trump administration adopting a declaratory policy that characterizes outer space as a "war-fighting domain" in which the US military is to seek "dominance". The National Space Strategy released in March 2018 was the first such strategy to employ this characterization of outer space.[36] President Trump's subsequent decision to establish a 'Space Force' as a separate but equal branch of the armed forces was in keeping with this new, more explicitly militarized vision of space. In what resembled something of 'the other guy started it first' justification, Vice President Pence, in an August 2018 speech at the Pentagon, asserted that "China and Russia are also aggressively working to incorporate anti-satellite attacks into their warfighting doctrines … As their actions make clear, our adversaries have transformed space into a warfighting domain already. And the United States will not shrink from this challenge".[37]

Beyond the more pugnacious rhetoric, there were also indications in defence authorization legislation that the United States would be once again contemplating putting missile defence into space. In both the 2018 National Defense Authorization Act and the 2019 Missile Defense Review there were calls for further research and investment in a space-based architecture for missile defence, including both sensors and possible interceptors. This move is, at least in part, motivated by advances in missile technology, such as hypersonic weapons, that the United States perceives

31 Brian Weeden and Victoria Samson, "The Impact of India's ASAT Test on Norms of Behavior for Space", 6 April 2019, https://spacenews.com/op-ed-indias-asat-test-is-wake-up-call-for-norms-of-behavior-in-space/.
32 Brian Weeden and Victoria Samson, "Global Counterspace Capabilities: An Open Source Assessment", Secure World Foundation, 2019, pp. 6-2, https://swfound.org/media/206408/swf_global_counterspace_april2019_web.pdf.
33 See Rajeswari Pilai Rajagopalan, "Electronic and Cyber Warfare in Outer Space", UNIDIR Space Dossier 3, 2019, https://www.unidir.org/files/publications/pdfs/electronic-and-cyber-warfare-in-outer-space-en-784.pdf.
34 Brian Weeden and Victoria Samson, "Global Counterspace Capabilities: An Open Source Assessment", Secure World Foundation, 2019, p. viii, https://swfound.org/media/206408/swf_global_counterspace_april2019_web.pdf.
35 See Daniel Porras, "Creeping towards an Arms Race in Outer Space", SIPRI Yearbook 2020: Armaments, Disarmament and International Security (forthcoming in 2020).
36 Brian Weeden and Victoria Samson, "Global Counterspace Capabilities: An Open Source Assessment", Secure World Foundation, 2019, pp. 3-18, https://swfound.org/media/206408/swf_global_counterspace_april2019_web.pdf.
37 Remarks by US Vice President Pence, 9 August 2018, https://www.whitehouse.gov/briefings-statements/remarks-vice-president-pence-future-u-s-military-space/.

to threaten its security. The 2019 National Defense Authorization Act directed the Missile Defense Agency "to carry out a program to develop boost phase intercept capabilities" for which space-basing is a principal option.[38] In the signing ceremony for the Presidential Directive establishing the Space Force, President Trump said that the United States was developing "a lot of new defensive weapons and offensive weapons" that they were now "going to take advantage of" with the new Space Force.[39] Overall, it appears that the rhetoric of maintaining strategic stability is being replaced by more overtly competitive actions—with space as one more domain in which this dynamic is playing out.

38 Space Security Index 2019, pp. 101, 134, http://spacesecurityindex.org/ssi_editions/space-security-2019/.
39 Brian Weeden and Victoria Samson, "Global Counterspace Capabilities: An Open Source Assessment", Secure World Foundation, 2019, pp. 3-18, https://swfound.org/media/206408/swf_global_counterspace_april2019_web.pdf. It should be noted that the United States has a large existing ASAT capability in its fielded missile defense systems. There are 44 interceptors which can reach all LEO, and the new upgrade to the Aegis system will potentially make it so there are hundreds of interceptors that can reach all of LEO and which are on mobile platforms. (I thank Laura Grego for pointing this out).

8. CONTEMPORARY DIPLOMATIC OPTIONS

Diplomatic initiatives are often less a product of independent development than a reaction to some disruptive external event. This observation certainly seems to apply to the realm of space security, where within a couple of years of the explosive 2007 Chinese ASAT tests no fewer than four diplomatic initiatives were launched in response to the revived threat of space warfighting that it represented. We will briefly consider these four initiatives and what their outcomes suggest for prospects for devising diplomatic arrangements to secure and sustain a benign environment in outer space. The four are: i) the Chinese–Russian draft treaty on The Prohibition of the Placement of Weapons in Outer Space, the Threat or Use of Force against Space Object, first tabled at the CD in 2008 with a revised version in 2014; ii) the European Union-initiated International Code of Conduct on Outer Space Activities, first issued in 2008; iii) Canadian proposals for space security confidence-building measures and 'pledges' put forward at the CD in 2007 and 2009; and iv) the two United Nations Groups of Governmental Experts established to consider transparency and confidence-building measures (TCBMs) and possible legal elements of a PAROS agreement. The first Group concluded in 2013 with a consensus report and the second Group concluded in 2019 without being able to issue a report.

8.1 PREVENTION OF PLACEMENT OF WEAPONS IN OUTER SPACE DRAFT TREATY

The only major proposal for a legally binding agreement for space security is the Chinese-Russian draft treaty on the prevention of placement of weapons in outer space and of the threat or use of force against outer space objects. The draft treaty was formally tabled at the CD in 2008, although its antecedents there date back to 2002 as noted earlier. After receiving some reactions from CD States, China and the Russian Federation submitted a revised version of the proposed treaty in June 2014.[40] Its sponsors have repeatedly said that they would welcome further discussion of the draft but, given the lack of an agreed programme of work at the CD and the absence of a consensus to re-establish an Ad Hoc Committee on its PAROS agenda item, there has been no subsidiary body at the CD to take up official work on this proposal. To date, China and the Russian Federation have been unwilling to take the draft treaty outside the CD for consideration and it remains in a form of suspended animation as the CD has been unable to negotiate new agreements since the 1990s in view of its strict consensus rule.

Since the tabling of the revised version of the draft treaty, the principal official action undertaken at the CD has been a critical analysis of the draft treaty submitted by the United States and a rebuttal of that criticism offered by China and the Russian Federation.[41] The US criticism mainly focuses on the lack of verification

40 "Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects", CD/1839, 29 February 2008, and CD/1985, 12 June 2014.
41 The US document is CD/1847 of 26 August 2008 and the China–Russia document is CD/1872 of 18 August 2009.

provisions and an inadequate scope given the failure to cover ground-based ASATs. The rebuttal argues that it is currently not feasible to verify a wider weapons ban, but only a prohibition on placement of space weapons and the use of force against space objects, although it foresees the possibility of elaborating verification measures in the future. With regard to ground-based ASATs, the Chinese-Russian rebuttal asserts that the draft treaty's ban on the use of force against space objects would preclude the use of such weapons and should therefore eliminate the incentive to develop and deploy them.[42] The rebuttal also hints at the major problem posed by missile defences with their inherent ASAT capability that would arise if an effort was made to cover ground-based ASATs in a treaty.

To a degree, the impasse over the draft treaty also points to an underlying debate regarding the acceptability of legally binding arms control accords in the present geopolitical context. While the United States continues to state that it is not opposed to space arms control agreements in principle, it appears to be opposed in practice, having made no proposal of its own or endorsed any other. Instead, during the 2015 General Assembly First Committee debate on outer space, US Ambassador Robert A. Wood said, "In contrast to the approach advocated by some States to pursue protracted negotiations to conclude a legally binding instrument, the United States is convinced that many outer space challenges confronting us could be addressed through practical, near-term initiatives, such as non-legally binding TCBMs".[43]

China and the Russian Federation, in continuing to champion their draft treaty, reflect their long-standing preference for legally binding instruments when addressing international security issues. In a rejoinder to Ambassador Wood, the Chinese representative called for "more convergence and … multilateral negotiations on an arms control treaty so as to effectively maintain safety and security of space". While recognizing the potential role of TCBMs as a complement to the non-weaponization of space, the Chinese delegate stressed that "given their intrinsic limitations, [TCBMs] cannot replace the negotiation of a legally-binding arms control treaty".[44]

In the absence of an active forum for engaging the spacefaring States and other parties in an effort to reconcile the views outlined above, it will be difficult to make progress on space security via the elaboration of new legally binding multilateral agreements.

42 See document CD/1872, 18 August 2009, https://documents-dds-ny.un.org/doc/UNDOC/GEN/G09/631/75/PDF/G0963175.pdf?OpenElement.

43 See the statement by US Ambassador Robert A. Wood to General Assembly First Committee, 23 October 2015, https://s3.amazonaws.com/unoda-web/wp-content/uploads/2015/10/19-October-US.pdf.

44 See the statement by the Chinese Delegation to the General Assembly First Committee, 23 October 2015, http://www.china-un.ch/eng/hom/t1308984.htm.

8.2 THE INTERNATIONAL CODE OF CONDUCT FOR OUTER SPACE ACTIVITIES

This European Union proposal, initially put forward in 2008, consists of a set of voluntary measures which represented an effort (in the words of the preamble) "to safeguard the continued peaceful and sustainable use of outer space for current and future generations".[45]

The International Code of Conduct was the product of complex negotiations within the European Union—a process hampered by personnel changes in the European External Action Service. Perhaps this accounts for why the process of bilateral consultations proved to be lengthy and plagued by problems. The European Union officially presented the draft Code with the support of several like-minded States (Australia, Canada and Chile) in Vienna in June 2012, outside of the United Nations framework. After this initial meeting, the European Union was strongly criticized by the Russian Federation, China, Brazil and by a large number of governments of developing countries because in their view the negotiation process leading to the Code had not been inclusive, and because the European Union had proposed that subsequent negotiations be conducted outside of United Nations processes. The European Union tried to increase the tempo and extent of its consultations in 2013 and 2014, but by then the interest of several non-European spacefaring States had waned over the EU-managed consultative process, if not in the idea of an international code of conduct as such.

Whether the EU diplomats misread the reactions of others or not, they decided that the draft Code was ready to move into a last round of multilateral consultations in order to finalize the text. However, the meeting that the European Union convened in New York on 27–31 July 2015 failed to produce the outcome they desired. The Russian Federation, which seems to have hardened its position regarding the Code in the aftermath of events in Ukraine, led Brazil, India, China and South Africa in expressing major dissent. These States issued a joint statement stipulating that "the elaboration of such an instrument should be held in the format of inclusive and consensus-based multilateral negotiations within the framework of the [United Nations], based on a proper and unequivocal mandate, without specific deadlines and taking into account the interests of all States".[46]

The European Union voiced its disappointment that this attempt to conclude the text of the Code had proven impossible after so much preparation. That said, EU States did not seek a new UN mandate for an open-ended negotiation process at the General Assembly, even though the Chair's summary of the July meeting recommended that course of action.

While there are non-governmental voices within the European Union calling for those States "to keep the [Code] on the table and under discussion at the [General Assembly]", it would seem that politically the European Union has abandoned the initiative, while still supportive of the principles within it.[47] Despite some promising content (e.g. provision for institutional support) the Code appears currently in a state of diplomatic limbo with no State (or States) committing to take the proposal forward.

45 "Draft International Code of Conduct for Outer Space Activities", 31 March 2014, www.eeas.europa.eu/non-proliferation-and-disarmament/pdf/space_code_conduct_draft_vers_31-march-2014_en.pdf.
46 See the BRICS Joint Statement of 27 July 2015, https://www.rusemb.org.uk/fnapr/5145.
47 Massimo Pellegrino and Gerald Stang, *Space Security for Europe*, Europe Union Institute for Security Studies, 2016, p. 85, https://www.iss.europa.eu/content/space-security-europe.

8.3 CANADIAN PROPOSALS ON THE NON-WEAPONIZATION OF OUTER SPACE

Canada has traditionally been diplomatically active in pursuit of the non-weaponization goal. In his address to the General Assembly in 2004, Prime Minister Paul Martin stated: "What a tragedy it would be if space became one big weapons arsenal and the scene of a new arms race. In 1967, the United Nations agreed that weapons of mass destruction must not be based in space. The time has come to extend this ban to all weapons".[48]

Aligned with this political direction, Canada followed up with specific proposals on outer space security in working papers submitted to the CD in 2007 and 2009. In the earlier paper, Canada proposed that i) States make better use of the confidence-building measures contained in existing accords such as the Outer Space Treaty and the Hague Code of Conduct; ii) a moratorium on ASAT tests be agreed; and iii) space situational awareness be conducted through a multilateral monitoring centre. In the 2009 paper, Canada suggested that States unilaterally commit to specific security 'pledges'; namely, a pledge not to place weapons in outer space, not to engage in destructive ASAT testing, and not to use a satellite as a weapon. These ideas were seen to represent a middle ground between a non-weaponization treaty like the Chinese–Russian draft treaty on the one hand and the 'security light' character of the voluntary measures contained in the European Union's Code on the other. Although these ideas were in keeping with Canada's usual effort at 'bridge building' among contending positions, they received little immediate traction at the United Nations and Canada failed to vigorously promote them.[49] Lately, in the CD, Canada has revived one of its earlier suggestions in advocating the negotiation of a ban on destructive ASAT tests.

8.4 THE GROUPS OF GOVERNMENTAL EXPERTS 2013 AND 2019

The Group of Governmental Experts (GGE) mechanism is frequently utilized at the General Assembly to enable a problem to be studied by a small, but representative, group of States. It normally entails 15–20 government-nominated experts meeting for a few weeks over a two-year term and producing a consensus report at the end, if they can all agree on one. Space security has been the subject of two such GGEs, one in the 2011–2013 period looking at TCBMs and another in the 2018–2019 time frame that considered possible legal elements of a PAROS agreement. The consensus report on TCBMs issued in 2013 represented something of a high-water mark in terms of a set of recommendations that could contribute to confidence building among States.[50] These included information exchange on national policies, notification of space activities, visits to space launch sites and a variety of consultative mechanisms.[51] However, the geopolitical climate was already worsening and there was little take-up of the GGE's recommendations. The 2018–2019 GGE appeared to make good progress and there was an expectation that it would also be able to produce a substantive report, but at the end consensus was not possible. The limited membership and consensus requirement impede the GGE mechanism in making a more influential contribution to space security diplomacy.

48 See the statement by Prime Minister of Canada Paul Martin to the General Assembly, document A/59/PV.5*, 22 September 2004, p. 30, https://undocs.org/en/A/59/PV.5.
49 See working papers CD/1815 (20 February 2007) and CD/1865, 5 June 2009.
50 See General Assembly, document A/68/189*, 29 July 2013.
51 Ibid.

9. CONCLUSIONS & RECOMMENDATIONS

The deteriorating geopolitical environment the international community is currently facing has had detrimental consequences for the effort to reinforce the Outer Space Treaty-centred regime for space security despite the repeated call of the PAROS resolution to do just that. The situation is such that the Secretary-General has called on States to "work urgently to preserve Outer Space as a realm of peace".[52]

At the same time, the 'devil's triangle' of offensive nuclear missiles, ballistic missile defence and outer space weaponization, with their inter-relationships and potential for destabilizing the strategic balance, makes achieving progress on any one element very difficult. In particular, any move to develop space-based ballistic missile defences will significantly complicate possible diplomatic options to strengthen space security and preclude weaponization. Space security diplomacy to date has enjoyed considerable latitude as the threat of space-based weapons has been more theoretical than practical, although ironically that situation has also reduced the motivation of States to actually achieve something in keeping with the aims of the PAROS resolution. The inherent complexities of these variables are currently exacerbated by a sharp decline in trust levels (and associated strategic dialogues) among leading military powers coupled with a revival of counterspace development programmes. This may be a time for other stakeholders, both governmental and non-governmental, to become more engaged in safeguarding the space environment against human-created threats. A renewal of creative diplomacy is called for and the author sees merit in at least three possible near-term initiatives.

AN OPTIONAL PROTOCOL TO THE OUTER SPACE TREATY

By such a mechanism, States could extend the ban on weapons of mass destruction to all forms of weaponry. An Optional Protocol would avoid the potential risks of amending the Outer Space Treaty while still imparting a legally binding status to this commitment and helping to establish the norm of non-weaponization that the vast majority of United Nations Member States declare that they want. This option is closely aligned with what States say they wish to see, although almost none have backed up such declarations with specific proposals for achieving the goal of non-weaponization. Since by definition Optional Protocols are only binding on those States accepting them, there would be concerns if major military space powers did not agree to join. However, it is likely that a large majority of Member States would still adopt such a Protocol given the amount of support PAROS resolutions receive each year in the General Assembly. In this way, the adoption of such a Protocol could still contribute towards establishing norms of behaviour under international law.

52 *Securing Our Common Future: An Agenda for Disarmament,* 2018, p. 28, https://s3.amazonaws.com/unoda-web/wp-content/uploads/2018/06/sg-disarmament-agenda-pubs-page.pdf.

NEGOTIATION OF AN INTERNATIONAL CODE OF CONDUCT UNDER UNITED NATIONS AUSPICES

There was much promise in the European Union's International Code of Conduct that could still be salvaged (and even improved upon) by seeking General Assembly authorization for commencement of a multilateral negotiation to produce such a document. It should be relatively straightforward for a State or group of States to gain support for such a resolution in the General Assembly. Launching such a negotiation at the United Nations would of course be no guarantee of a successful outcome, but it would provide an authoritative forum for discussing the substantive content of the draft Code, including its innovative provisions for institutional follow-up and support.

NEGOTIATION OF A BAN ON DESTRUCTIVE ASAT TESTS

With increased concern over the space debris hazard (and the potential posed by the launch of satellite constellations for adding to this existing problem) there has been a revival of interest in arranging a ban (or even a moratorium) on destructive ASAT testing. Introducing such a measure now, when tests have only been conducted in low Earth orbit, would prevent development of high-orbit ASATs which would threaten existing early warning satellites. Such a negotiation could be launched via a General Assembly resolution or at an ad hoc diplomatic conference of concerned parties. While there would seem to be a common interest even among rival States in agreeing to such a measure, there may be a reluctance by some States to support such an agreement if it did not cover non-destructive ASAT technology and development as well.[53]

Regardless of how these individual options fare, it is evident that the current space security context will put a premium on leadership if the negative trends are to be countered. Although the international community has long espoused the development of further measures to reinforce the existing regime for outer space security, actual diplomatic initiatives to this end have been few and far between. The inter-relationship between space security (and the spectre of its weaponization) and the triad of nuclear forces and deterrence, nuclear arms control and disarmament and ballistic missile defences, will continue to make progress in any one element a complicated endeavour even given a better geopolitical climate than currently exists. Technical developments and the rapid growth of private sector space assets far outpace diplomatic efforts to safeguard the relatively benign operating environment of outer space. The pursuit of cooperative security solutions to the problems identified in this paper will require a much greater level of diplomatic energy and engagement if progress is to be achieved. The world will need some State champions of cooperative space security if the strategic tensions outlined above are to be overcome.

53 Some recent proposals are described in Alexey Arbatov, "Arms Control in Outer Space: The Russian Angle, and a Possible Way Forward", and Daniel Porras, "Anti-satellite Warfare and the Case for an Alternative Draft Treaty for Space Security", in *Bulletin of the Atomic Scientists,* vol. 75, no. 4, 2019.

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BALLISTIC MISSILE DEFENCE & OUTER SPACE SECURITY

A STRATEGIC INTERDEPENDENCE

Today, international security is facing threats from a 'devil's triangle' of arms capabilities, presented by offensive nuclear missiles, ballistic missile defence and outer space weaponization. These three are, and have been, inter-connected due to their technological and strategic natures. They are also the source of some of the most challenging diplomatic debates, particularly in today's tense geopolitical climate. Current events indicate that States are moving away from a position of restraint and towards accelerated development. This paper traces the roots of the relationship between missiles, missile defence and anti-satellite weapons to show where current trends might lead, and to offer some useful ideas on how to use diplomacy to find a new path for arms control.

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