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A PROPOSAL FOR A BAN ON DESTRUCTIVE ANTI-SATELLITE TESTING: A ROLE FOR THE EUROPEAN UNION?

NIVEDITA RAJU

I. INTRODUCTION

Space assets—such as satellites, launch vehicles and supporting infrastructure—have assumed a critical role as space has become an increasingly prominent area for security.[1] The significance of these assets has resulted in the development, since the 1950s, of anti-satellite (ASAT) capabilities designed to interfere with these systems or, in some cases, destroy them entirely. There are different categories of ASAT tests, including destructive tests, which result in destroying the target and generating debris. The destructive testing of ASATs, including tests conducted by China in 2007 and India in 2019, creates new debris in outer space which poses a hazard to all other users of space. The uncertainty of the legal status of ASATs has been the cause of much debate. This debate continued in 2020 amid accusations from the United States that Russia was conducting ASAT tests. Space security is, hence, clamouring for policy intervention in this area. Months after the Chinese ASAT test in 2007, the European Union (EU) developed a draft Code of Conduct for Outer Space Activities to strengthen space security, officially released in 2008.[2] While negotiations for the draft Code broke down in 2015, the Code nonetheless offers valuable insight into how future space security measures should be designed.

This paper discusses the threats posed by this kind of testing and proposes a new policy initiative to prohibit destructive ASAT testing. Drawing

[1] For example, remote sensing and GPS were central to the 1991 Iraq–Kuwait conflict as well as the 1996 conflict over Kosovo. See Freeland, S., 'The laws of war in outer space', eds K. U. Schrogl et al., *Handbook of Space Security* (Springer: New York, 2015), pp. 99–101.

[2] Council of the European Union, 'Council conclusions and draft Code of Conduct for Outer Space Activities', 17175/08, 17 Dec. 2008.

SUMMARY

International fora have pursued space security regulation with little progress. The European Union (EU) has been proactive in this regard by advocating a multilateral code of conduct for outer space activities, however, it failed to survive negotiations. Further concrete measures to strengthen space security on a multilateral scale have been slow, as states are polarized on the subject of weaponization in outer space. Among threats to space security, destructive anti-satellite (ASAT) testing has emerged as a particularly destabilizing force. With an increasing number of states demonstrating ASAT capabilities, the regulation of ASATs demands action to prevent tensions from escalating to the point of conflict. This paper gives an overview of past ASAT tests and argues that destructive ASAT testing requires urgent policy intervention. The paper proposes a complete ban on destructive ASAT testing, drawing inferences from the EU's draft Code of Conduct for Outer Space Activities. The paper additionally proposes that the EU assumes the role of facilitator in the proposed policy measure.

ABOUT THE AUTHOR

Nivedita Raju (India) is an Indian specialist in space security. She is currently Associate Researcher with SIPRI and a Research Fellow with Open Lunar Foundation. She is also Director of Legal Affairs for Space Court Foundation, a non-profit that promotes accessibility to space education.

conclusions from the Code of Conduct, it suggests that the EU assumes the role of facilitator to moderate this dialogue. Sections II and III introduce the different types of ASAT technologies and provide a brief history of past tests conducted. The legal context of destructive ASAT testing under the international space treaties and alternative forms of space lawmaking through international non-binding instruments is set out in sections IV and V. Section VI analyses the EU's draft Code of Conduct as one such instrument and determines how a new measure could be more successful, based on this analysis. The paper presents recommendations in section VI on how both substance and process of a new measure could be designed in a manner that appeals to all stakeholders.

II. ANTI-SATELLITE TECHNOLOGY

Counterspace refers to the set of capabilities or techniques that are used to gain space superiority, and these capabilities have both offensive and defensive elements.[3] ASAT weapons are a subset of offensive counterspace capabilities.[4] The expression anti-satellite, ASAT, is used broadly, and encompasses a wide range of technologies that can be classified as kinetic or non-kinetic, and ground-based or space-based.[5] Kinetic ASATs involve motion-based physical destruction, while non-kinetic ASATs use other means of interference such as jamming, laser dazzling and cyber interference. While some countries possess kinetic ASAT capabilities, as of today only non-kinetic technologies are actively used in military operations.[6] This section demonstrates the wide variety of ASAT technologies.

Kinetic energy anti-satellites

There are two types of kinetic energy ASATs: direct-ascent attacks and co-orbital ASATs. Kinetic energy attacks launched from the earth (i.e. ground-based ASATs) that attempt to destroy a satellite without placing an object in orbit are referred to as direct-ascent attacks. The ASAT here is an interceptor launched on a missile and released in the direction of the target satellite. Shortly before intercept, it may release a cloud of pellets to increase the chance of collision with the target.[7] Direct-ascent ASATs thus do not need to be placed in orbit (see section IV) and can simply be launched with short-range missiles into low Earth orbit (LEO). This is why satellites in LEO are more vulnerable than satellites in other orbits.

Co-orbital ASATs are space-based ASATs and derive their name from being launched into the same orbit as the target satellite, where they move near enough to launch explosives and destroy the target.[8] Like direct-ascent ASATs, this type can also use unguided clouds of pellets, or homing interceptors, which are launched shortly before the attack.[9] Co-orbital ASATs have the advantage of being camouflaged and give the target limited warning before attack.

Non-kinetic anti-satellites

Non-kinetic ASATs include electronic interference by jamming, spoofing and meaconing. The International Telecommunication Union (ITU) defines harmful interference as interference which 'seriously degrades, obstructs or repeatedly interrupts a radiocommunication service'.[10] In assessing interference, the ITU considers whether such interference has actually occurred, and disregards any element of intent. Jamming is not defined in international law but is commonly understood to mean interference intended by the perpetrator to disrupt the signal of the target satellite. Spoofing is another type of intentional interference, wherein a device emits what appear to be correct signals—for example signals from the Global Navigation Satellite System—but which are incorrect and intended to mislead the receiver.[11] Meaconing has a similar intention but rather than generating a false signal, it instead intercepts and rebroadcasts the signals.

Non-kinetic ASATs also include lasers, which can have different levels of intensity: low power or

[3] Weeden, B. and Samson, V. (eds), *Global Counterspace Capabilities: An Open Source Assessment* (Secure World Foundation: Washington, DC, Apr. 2019).

[4] Weeden and Samson (note 3).

[5] Wright, D., Grego, L. and Gronlund, L., *The Physics of Space Security: A Reference Manual* (American Academy of Arts and Sciences: Cambridge, MA, May 2005), p. 5.

[6] See Weeden, B. and Samson, V. (eds), *Global Counterspace Capabilities: An Open Source Assessment* (Secure World Foundation: Washington, DC, Apr. 2020).

[7] Wright, Grego and Gronlund (note 5), p. 5.

[8] Grego, L., 'A history of anti-satellite programs', Union of Concerned Scientists, Jan. 2012, p. 3.

[9] Wright, Grego and Gronlund (note 5), p. 137.

[10] See International Telecommunication Union, 'Constitution of the International Telecommunication Union', annex, 1003.

[11] Jakhu, R. S. and Pelton, J. N. (eds), *Global Space Governance: An International Study* (Springer International Publishing: New York, 2017), p. 193.

high power. Low-power lasers can overwhelm or dazzle a target satellite's sensor, thereby temporarily incapacitating it of its remote-sensing capabilities. These lasers can also blind sensors to the point of permanent damage.[12] With low-power lasers capable of such damage, there is growing apprehension about the development of high-power lasers that could not only interfere with the sensors of a satellite, but destroy its structure entirely.

High-power microwave attacks are an additional category of non-kinetic ASATs that can disrupt or damage the electrical systems of a satellite if enough of their energy enters these systems. Microwave attacks can attempt to enter a satellite through its antennae (a front-door attack) or through other routes, such as seams in the satellite's casing (a back-door attack).[13] If sufficient energy is employed, the target satellite can suffer permanent damage.

III. A BRIEF HISTORY OF ANTI-SATELLITE TESTS

While several states possess the counterspace capabilities outlined above, there is an urgent need to regulate kinetic ASAT testing due to its destructive effects. This section outlines publicly recorded ASAT tests by states with kinetic counterspace capabilities which can physically destroy other states' space systems and permanently alter the space environment.

United States

The USA has adopted an ASAT programme largely focused on direct-ascent technology. None of the ASAT tests the USA conducted in the late 1950s were destructive, as they were unsuccessful and missed their targets. The USA's first successful destructive ASAT test occurred in 1985. The test was a direct-ascent attack involving an interceptor against an American Solwind satellite, which intentionally generated hundreds of pieces of space debris.[14] Both the Soviet Union and the USA legislated bans on testing ASATs in reaction to this test. The USA then revoked its ban in 1988 when intelligence suggested that the Soviet Union was developing laser technology that threatened satellites (an example of the vicious cycle of conflict-inducing rhetoric). The USA subsequently developed a Mid-infrared Advanced Chemical Laser (MIRACL) which was reportedly tested against one of its own satellites in 1997 with confidential results.[15] In 2008, the USA deployed a modified missile to destroy one of its own defunct satellites. This test, named Operation Burnt Frost, generated over one hundred pieces of trackable debris in LEO.[16] The political motivations for this particular test are questionable. Some commentators have argued that the USA was compelled to display its own aggressive capabilities after China's successful ASAT test in 2007, although the official motivation given by the USA was that the fuel tank of their target satellite contained large quantities of hydrazine which posed a danger to humans.[17] No further destructive ASAT tests have been conducted by the USA since.

Russia

The ASAT technologies of both Russia and the USA reflect their political rivalry during the cold war, wherein each nation fortified technologies in response to the perceived threat of the other. The Soviet Union focused on co-orbital technology, in contrast to the USA, which had focused on direct-ascent technology. The testing phase of the Soviet co-orbital system began in 1963 and consisted of seven close approaches or 'interceptions', five of which culminated in interceptor detonations and were considered successful.[18] The Soviets then developed Istrebitel Sputnikov, an anti-satellite programme literally meaning 'destroyer of satellites', wherein the interceptor was designed to approach a satellite within one or two orbits. The Soviet Union continued to conduct tests of its co-orbital ASAT system, with four tests conducted in 1976, four further tests in 1977 and approximately one intercept test per year between 1978 and 1982. The debris generated from these destructive tests was significant.[19]

[12] Grego (note 8), p. 6.
[13] Wright, Grego and Gronlund (note 5), p. 17.
[14] Grego (note 8), p. 5; and Union of Concerned Scientists, 'Space debris from anti-satellite weapons', Fact Sheet, Apr. 2008.
[15] Burns, J. F., 'Andropov issues a promise on antisatellite weapons', *New York Times*, 19 Aug. 1983.
[16] Weeden, B., 'Through a glass, darkly: Chinese, American, and Russian anti-satellite testing in space', Secure World Foundation, Mar. 2014, p. 26–27.
[17] See NBC News, 'US downplays threat from falling satellite', 26 Jan. 2008; C-Span, 'Destruction of spy satellite', 21 Feb. 2008; and Johnson, N., 'Operation Burnt Frost: A view from inside', *Space Policy*, vol. 56 (2021).
[18] Grego (note 8), p. 3.
[19] Porras, D., 'Towards ASAT test guidelines', United Nations Institute for Disarmament Research (UNIDIR), 2018, p. 4; and Union of Concerned Scientists (note 14).

Russia has conducted several ASAT tests using direct-ascent technology in the last decade. There is no conclusive evidence as to whether the first test of its anti-satellite missile, known as Nudol, was non-destructive, but the following Nudol tests in 2016 and 2018 are both confirmed to have simply completed several orbits before returning to earth.[20]

The year 2020 witnessed several accusations against Russia, beginning with the US claim that Russian satellite Cosmos-2542 ejected a subsatellite, Cosmos-2543, in an attempt to spy on US reconnaissance satellite USA-245.[21] The US Space Command then accused Russia of conducting a direct-ascent ASAT test of its Nudol interceptor.[22] General John Raymond of the Space Command declared that the test was 'further proof of Russia's hypocritical advocacy of outer space arms control proposals designed to restrict the capabilities of the United States while clearly having no intention of halting their counterspace weapons programs.'[23] This was followed by another report by the USA in July 2020 that there was evidence that Russia had conducted a non-destructive space-based ASAT test when Russia injected a new object into orbit from Cosmos-2543.[24] In December 2020, the USA reported that Russia had tested a new ground-based direct-ascent missile which was also non-destructive.[25] However, to label these Russian activities as hostile, or even classify the latter incident as weaponization is a flawed over-simplification. These terms are heavily laced with ambiguity in international law since there is no consensus on thresholds for either expression in the space treaties (see section IV below).

China

China's counterspace capabilities originated with direct-ascent technology. Their development was rooted in anti-ballistic and surface-to-air missile programmes from the 1960s through to the 1990s.[26] Today, China has direct-ascent, co-orbital, directed energy and electronic counterspace capabilities. China's spacefaring capacity has resulted in a tangible shift in political dynamics; Russia and the USA are no longer the sole powers dominating the space sector.

In 2006, the USA reported that China had used a laser to illuminate a US observation satellite.[27] There was neither conclusive evidence of damage sustained by the satellite nor proof that the incident was an intent to blind or dazzle the US satellite. China conducted a destructive test in 2007 that is perhaps the most widely documented due to the mass of debris generated. China used a kinetic-kill vehicle in a direct-ascent attack to destroy one of its own defunct weather satellites, Fengyun 1-C.[28] This ASAT test generated more than 2500 trackable pieces of debris (the largest amount ever tracked) and about 150 000 smaller pieces.[29] The debris of this test has since spread across LEO and continues to be tracked to prevent future collisions with other objects in space. China faced international condemnation for its actions, after which the country adopted an even more secretive approach to developing counterspace ASAT capabilities. Between 2010 and 2018, China reportedly conducted five missile intercept tests with minimal to no debris.[30] In 2013, China also tested a direct-ascent system with the capacity to reach the geostationary orbit (GEO). While this test did not involve a strike with a target, it is a formidable capability because most countries' satellites for military and telecommunications purposes are placed in GEO. China has not publicly conducted destructive ASAT tests since 2013.[31]

India

India, like China, has risen as a space contender. Both countries have continued to engage in a strategic rivalry since the 1962 war between China and India. India–USA relations consequently evolved to enable

[20] Gertz, B., 'Russia flight tests anti-satellite missile', Washington Free Beacon, 2 Dec. 2015; Panda, A., 'Russia conducts new test of "Nudol" anti-satellite system', The Diplomat, 2 Apr. 2018; and Sciutto, J., Starr, B. and Browne, R., 'Russia tests anti-satellite weapon', 21 Dec. 2016.

[21] Erwin, S., 'Raymond calls out Russia for "threatening behavior" in outer space', Space News, 10 Feb. 2020.

[22] See Kimball, D. G., 'Russian ASAT test sparks war of words', Arms Control Association, May 2020.

[23] Kimball (note 22).

[24] US Space Command, 'Russia conducts space-based anti-satellite weapons test', 23 July 2020.

[25] US Space Command, 'Russia tests direct-ascent anti-satellite missile', 16 Dec. 2020.

[26] Weeden, B., 'Current and future trends in Chinese counterspace capabilities', French Institute of International Relations (IFRI), Proliferation Paper, no. 62, Nov. 2020, p. 23.

[27] Space News, 'NRO confirms Chinese laser test illuminated US spacecraft', 3 Oct. 2006.

[28] David, L., 'China's anti-satellite test: Worrisome debris cloud circles earth', Space, 2 Feb. 2007.

[29] Weeden, B., '2007 Chinese anti-satellite test', Secure World Foundation, Fact Sheet, 23 Nov. 2010.

[30] Weeden, B., 'Anti-satellite tests in space: The case of China', Secure World Foundation, Fact Sheet, 16 Aug. 2013; and Porras (note 19), p. 5.

[31] Weeden and Samson (note 3).

the USA to support India in balancing Chinese power in the region.[32] India's 2019 ASAT test and subsequent responses from other countries demonstrate these dynamics.

India conducted its first ASAT test, Mission Shakti, in 2019, a direct-ascent attack using kinetic-kill technology to destroy one of its own satellites.[33] Indian officials claimed that '[t]he ASAT interceptor had the capability to intercept satellites higher than 1,000 kilometres (km), but the mission was planned at the lowest possible orbit of less than 300 km, well below the orbit of other space objects to avoid the threat of debris.'[34] This statement is dubious, given that hundreds of pieces of debris were nonetheless created by this test.[35] As the literal translation of 'shakti' is 'strength' or 'power', the unprompted show of force was viewed by Indian opposition parties as an election stunt for the ruling administration.[36] While Prime Minister Narendra Modi declared that the test was 'not directed against anyone', and that 'India has always been opposed to the weaponisation of space and an arms race in outer space', it is likely that India's actions were fuelled by China's 2007 test.[37]

Responses to destructive anti-satellite tests

The responses to destructive ASAT testing by each of these nations vary. These responses can be instructive in proposing a new policy as they exhibit states' shared concern regarding destructive ASAT testing. For example, the global response to the most recent test, India's ASAT test, was mixed. Even within the USA, the US State Department and the National Aeronautics and Space Administration (NASA) appear to have had different positions, with NASA's administrator initially decrying Mission Shakti as 'a terrible, terrible thing'.[38] Conversely, the US State Department indicated that such debris was unlikely to remain in orbit and reiterated that the USA was keen to pursue relations with India.[39] China released a statement to the effect that it hoped for continued peaceful uses of outer space while Russia took a more diplomatic stance in observing that India's test was not targeted against any nation and invited India to join the China–Russia initiative for a treaty on the prevention and placement of weapons in outer space (PPWT).[40]

These responses—while reflecting geopolitical alliances—exhibit that the space powers share similar concerns about destructive ASAT testing and indicate a new avenue for future regulation. The concerns of these states are twofold; first, such tests are detrimental to space security, and second, they can produce adverse changes in the space environment. The first concern is legitimate because a state demonstrating its capabilities can spur reactionary tests from other nations, as indicated above. The second concern is equally justifiable, due to the potential cascading effect of each of these individual pieces of debris to create further debris by colliding with each other—a phenomenon named the Kessler Syndrome.[41] While the debris from some tests may have deorbited, numerous pieces continue to pose a threat. In February 2020, the European Space Agency (ESA) estimated there are approximately 34 000 pieces of space debris larger than 10 centimetres, 900 000 objects between 1 cm and 10 cm and 128 million objects between 1 millimetre and 1 cm.[42] Collisions have been recorded between space debris and both active and defunct space objects.[43] To date, the International Space Station has been forced

[32] Arif, M., 'Strategic landscape of South Asia and prevention of arms race in outer space', *Astropolitics: The International Journal of Space Politics & Policy*, vol. 17, no. 1 (2019).

[33] Pubby, M., 'India tests first anti-satellite system, codenamed Mission Shakti', *Economic Times* (India), 28 Mar. 2019.

[34] Shukla, A., 'Conducted Mission Shakti responsibly, space debris no longer a danger: DRDO', *Business Standard*, 6 Apr. 2019.

[35] Clark, S., 'US military sensors track debris from Indian anti-satellite test', Spaceflight Now, 27 Mar. 2019.

[36] See *The Hindu*, 'Mission Shakti: War of words as opposition questions Narendra Modi's address', 27 Mar. 2019; and Bhatnagar, G. V., 'Former CECs say Modi's "Mission Shakti" speech could have violated model code', 27 Mar. 2019.

[37] Indian Ministry of External Affairs, 'Speech by Prime Minister on "Mission Shakti", India's anti-satellite missile test conducted on 27 March, 2019', 27 Mar. 2019; and pursuant to China's 2007 test, Indian officials including former president A. P. J. Abdul Kalam hinted at India's ability to conduct similar tests. See Rajagopalan, R. P., 'India's changing policy on space militarization: The impact of China's ASAT test', *India Review*, vol. 10, no. 4 (2011), p. 367–68.

[38] Grush, L., 'More than 50 pieces of debris remain in space after India destroyed its own satellite in March', The Verge, 8 Aug. 2019.

[39] The Quint, 'US State Dept responds to NASA's comment on Mission Shakti', 3 Apr. 2019.

[40] Varma, K. J. M., 'China on Mission Shakti: "Hope each country will uphold peace in outer space"', Mint, 27 Mar. 2019; Siddiqui, H., 'India's A-SAT test mission Shakti: Decoding "friends" US and Russia's reaction', Financial Express, 30 Mar. 2019; and Ministry of Foreign Affairs of the People's Republic of China, 'Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (Draft), PPWT' 16 June 2014.

[41] Kessler, D. and Cour-Palais, B. G., 'Collision frequency of artificial satellites: The creation of a debris belt', *Journal of Geophysical Research*, vol. 83, no. A6 (1978), p. 2637.

[42] European Space Agency, 'Space debris by the numbers', 2019.

[43] For example, the collision of US satellite Iridium with defunct Russian satellite Cosmos-2251 in 2009 which created further debris.

to conduct several avoidance manoeuvres to prevent collisions with space debris.[44]

The geopolitical aspect of destructive ASAT testing, thus, encourages further displays and development of offensive technology. The physical aspect of destructive ASAT testing also amplifies the critical issue that space debris constitutes a threat to states' space systems. States, particularly the aforementioned powers leading in kinetic capabilities, could be open to considering a new policy measure that affords protection to their space systems because of these two aspects.

IV. DESTRUCTIVE ANTI-SATELLITES UNDER THE SPACE TREATIES

The legal status of destructive ASATs is ambiguous under international law despite the threat ASATs pose to space systems. The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty) was the first binding multilateral space treaty and has the objective of ensuring the peaceful use and shared benefits of outer space amongst all nations.[45] Article I of the Treaty recognizes the wide freedom of all states to explore and use space.[46] However subsequent provisions in the treaty limit this freedom by imposing obligations. Thus, there are several provisions in the treaty that could regulate ASATs, but these do not provide sufficient restrictions.

Outer Space Treaty

Peaceful purposes

The preamble of the Outer Space Treaty contains references to the exploration and use of outer space for peaceful purposes.[47] Additionally, Article IV expressly states that the moon and other celestial bodies shall be used 'exclusively for peaceful purposes'.[48] The meaning of this term has been a point of contention, with some arguing that peaceful means non-military.[49] This argument is weak, as space has technically been 'militarized' since the beginning of the space age. States have conducted missions using military personnel and openly used space for military purposes such as reconnaissance and communication. Peaceful, in the context of the treaty, therefore, implies non-aggressive rather than non-military. While destructive ASATs are purely offensive in nature, ASAT tests against a country's own space assets would not violate this provision. However, tests on or near celestial bodies would be prohibited.

Threat or use of force

Article III of the treaty specifically requires compliance with the UN Charter, providing a gateway to compliance with general principles of international law.[50] Through this provision, states must comply with the standard international law thresholds on the use of force. There is no definition of activities which constitute a use of force. Article 2(4) of the UN Charter states: '[a]ll Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the Purposes of the United Nations.'[51] The exceptions to use of force lie in the need for 'collective security' to maintain international peace and security, and under Article 51 which permits states to act in self-defence.[52] The circumstances for a state's exercise of the right of self-defence require an ongoing international armed conflict and an 'imminent' threat to the state. The use of force in self-defence must hence be necessary and proportionate.[53] In the absence of these conditions, kinetic ASATs with such destructive impact cannot constitute a legitimate use of force.

Placing in orbit

Article IV of the treaty requires states 'not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass

[44] *The Guardian*, 'ISS forced to move to avoid space debris', 23 Sep. 2020.

[45] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty), opened for signature on 27 Jan. 1967, entered into force on 10 Oct. 1967, 610 UNTS 205.

[46] Outer Space Treaty (note 45), Article I.

[47] Outer Space Treaty (note 45), Preamble.

[48] Outer Space Treaty (note 45), Article IV.

[49] See generally Lachs, M. et al., *The Law of Outer Space: An Experience in Contemporary Law-making* (Martijnus Nihoff Publishers: Leiden and Boston, 2010), pp. 97–105.

[50] Outer Space Treaty (note 45), Article III.

[51] Charter of the United Nations (UN Charter), signed on 26 June 1945, entered into force on 24 Oct. 1945, Article 2(4).

[52] UN Charter (note 51), Articles 24, 25 and 51.

[53] See the Caroline Case, *British and Foreign State Papers*, vol. 29 (1840), p. 1137; and Brownlie, I., *Principles of Public International Law* (Oxford University Press: Oxford, 2008), pp. 733–34.

destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.'[54] Since the expressions 'place', 'install' and 'station' are not defined, the ordinary meaning of these terms applies, indicating that a weapon would have to linger in orbit to be included within the scope of this prohibition.[55] However, this interpretation is still broad. Firstly, the prohibition only applies to nuclear weapons or weapons of mass destruction, and secondly it implies that mere transit of such weapons through outer space is still permissible. This interpretation is supported by Russian and US state practice on the use of intercontinental ballistic missiles in outer space, which means that states never intended to outlaw the transit of such weapons. The destructive ASAT tests described above are therefore beyond the purview of this regulation.

Due regard and harmful interference

Article IX of the treaty requires states to conduct activities 'with due regard to the corresponding interests of all other States Parties to the Treaty.'[56] Due regard in international law, as reflected in other conventions, places an obligation on the state to conduct its activities in a manner that does not interfere with or compromise their activities, and in this context applies to the safety of space operations.[57] States must hence avoid harm to other states and foresee potential damage. Evidence of this principle can be traced back to as early as 1950, in the Corfu Channel case.[58] The Permanent Court of Arbitration has held that the obligation of due regard does not have a universal rule of conduct and that the precise scope of the rule is defined by the circumstances in each case.[59] An ASAT test that generates debris and simultaneously increases the risk of collision with other states' space objects can be viewed as a violation of due regard. The generation of debris pursuant to collision with the target is also reasonably foreseeable.[60] Given the record of space debris collisions, this is also a violation.

Article IX of the Outer Space Treaty places an additional obligation on states. If a state has 'reason to believe' that its activity may cause 'potentially harmful interference' with the space activities of other states, it is required to undertake 'appropriate international consultations before proceeding with any such activity or experiment.'[61] The subjective element is painfully evident from this wording, as it implies that a state only has an obligation if it has 'reason to believe that an activity . . . would cause potentially harmful interference'. Despite this subjectivity, there is an obligation for consultation, whatever form it may take—even a mere notice or announcement could fulfil this requirement. Yet none of the states who engaged in destructive ASAT testing complied with any consultation, even with the knowledge that their tests would have consequences for other states in the form of more space debris. On these grounds, destructive ASAT testing can be viewed as a violation of Article IX.

Liability Convention

Another space treaty that may be applicable is the 1972 Convention on International Liability for Damage Caused by Space Objects (Liability Convention).[62] There are two proposed liability schemes under the convention. The first scheme would apply in a situation in which the debris from an ASAT test damages a passing flight.[63] The second envisaged situation is one wherein the debris damages another state's space object.[64] In the first situation, the state conducting the test would assume absolute liability under the convention, meaning that the responsible party has to pay compensation even if the collision was accidental and not due to their negligence. In the second case, liability would be fault-based, where the affected state would have to submit evidence of damage and demonstrate a causal link between the ASAT-testing

[54] Outer Space Treaty (note 45), Article IV.

[55] See rules of treaty interpretation, Vienna Convention on the Law of Treaties, 23 May 1969, entered into force 27 Jan. 1980, *United Nations Treaty Series*, vol. 1155 (2005), Article 31(1).

[56] Outer Space Treaty (note 45), Article IX.

[57] See International Civil Aviation Organization (ICAO), Convention on International Civil Aviation, signed on 7 Dec. 1944, ICAO Doc 7300/9, Article 3(d); United Nations Convention on the Law of the Sea, opened for signature 10 Dec. 1982, entered into force 16 Nov. 1994, 1833 UNTS 397, preamble and Articles 87(2), 56(2) and 58(3); and Hobe S. et al. (eds), *Cologne Commentary on Space Law, Volume 1* (Carl Heymanns Verlag: Cologne, 2009), p. 175.

[58] International Court of Justice (ICJ), 'Corfu Channel' (*United Kingdom of Great Britain and Northern Ireland v. Albania*), Judgment of 9 Apr. 1949, *ICJ Reports*, 1949, p. 22.

[59] Permanent Court of Arbitration, 'Chagos Marine Protected Area Arbitration (Mauritius v. United Kingdom)', Case no. 2011-03, Award, 18 Mar. 2015, para. 519.

[60] Hanqin, X., *Transboundary Damage in International Law* (Cambridge University Press: Cambridge, 2009), p. 14.

[61] Outer Space Treaty (note 45), Article IX.

[62] Convention on International Liability for Damage Caused by Space Objects (Liability Convention), entered into force 1 Sep. 1972, 961 UNTS 187.

[63] Liability Convention (note 62), Article II.

[64] Liability Convention (note 62), Article III.

Box 1. National legislation

The past few decades have witnessed a shift to lawmaking through national avenues. This shift can be attributed in part to the Outer Space Treaty. It imposes responsibility and liability on states for their actions in outer space, including for the actions of their non-governmental entities, primarily private sector companies, under articles VI and VII. States have consequently introduced domestic legislation to ensure that these entities receive governmental supervision, for example, through the issuance of licenses for space activities and approvals for launches.[a] In developing their domestic space policies, states also seize the opportunity to incorporate provisions that will simultaneously support national interests, such as promoting the commercial space sector.[b] As a result, the space policies of states tend to differ because countries prioritize different areas of space applications.

States also use national policy to interpret ambiguous areas of international space law. For example, the delimitation of airspace and outer space has undergone much debate and remains unresolved at the international level.[c] While the debate was ongoing, Australia amended its national legislation to officially recognize outer space as the space 'beyond the distance of 100 km' for national regulatory purposes.[d] Similarly, the United States has pursued legalizing the use of space resources, a hotly contested subject, through national space legislation and National Aeronautics and Space Administration's (NASA) new Artemis Accords.[e] These examples showcase the ability of states to engage in space lawmaking through a national medium due to the increasing lack of faith in international processes.

[a] For examples, see UN Office for Outer Space Affairs, 'Selected examples of national laws governing space activities: Sweden—Act on Space Activities (1982:963)', Section 2 regarding authorization and licensing; and British Government, Outer Space Act 1986, UK Public General Acts (1986), Section 4, regarding grant of license.

[b] For example, see Government of Luxembourg, Law on the Exploration and Use of Space Resources, signed into law on 20 July 2017; and Raju, N, 'Are we there yet? Identifying the crystallisation of custom through exploitation of resources in outer space', Annals of Air and Space Law, vol. XLIII (2018), p. 281.

[c] As one of the oldest items on the agenda of UNCOPUOS, the Legal Subcommittee continues to conduct discussions at the Working Group on the Definition and Delimitation of Outer Space. See UN Office for Outer Space Affairs, 'Working Group on the Definition and Delimitation of Outer Space of the Legal Subcomittee'.

[d] See Australian Government, Space Activities Act 1998, definition of 'launch'.

[e] US Commercial Space Launch Competitiveness Act, US Public Law 114–90, signed into law on 13 May 2015; and NASA, Artemis Accords: Principles for Cooperation in the Civil Exploration and use of the Moon, Mars, Comets and Asteroids for Peaceful Purposes, 13 Oct. 2020.

state's actions and resultant damage. States may therefore find a new policy measure encouraging, as it would limit their own liability.

The Outer Space Treaty and the Liability Convention are two of the original space treaties, introduced in 1967 and 1972. The aforementioned analysis reveals that the Outer Space Treaty does not clearly define the permissibility of ASATs. There have been multilateral processes to clarify these provisions and introduce further regulation. However, they have either been slow or have not been enforced due to their soft normative power. The next section highlights these processes and notes countries' growing preference to clarify legality using national legislation.

V. SPACE LAWMAKING: 1980S TO PRESENT DAY

International instruments: Non-binding and voluntary

Political dynamics in the space arena have evolved since the space treaties were enacted. At the time, the Soviet Union and the USA were the dominant space powers, and they pursued negotiations of the treaties to ensure shared and peaceful use of the space domain. Other states have, however, also developed significant spacefaring capabilities since the 1960s. These include China, France, India and the United Kingdom. The well-known nuclear capabilities of some of these states, particularly China and India, have led to increasing suspicion about the use of space as a war-fighting domain.

The UN has made several attempts to introduce new international regulations. In 1981 the UN General Assembly adopted a resolution on the 'prevention of an arms race in outer space' (PAROS).[65] This resolution continues to be adopted annually, but there is little substantive progress on concrete measures. The UN also constituted Groups of Governmental Experts (GGEs) in 1993 and 2013 to study transparency and confidence-building measures (TCBMs) in outer space.[66] However the UN Conference on Disarmament

[65] UN General Assembly Resolution 36/97C, 9 Dec. 1981.

[66] UN, General Assembly, 'Prevention of an arms race in outer space: Study on the application of confidence-building measures in outer space', Report by the Secretary-General, A/48/305, 15 Oct. 1993; and UN General Assembly, 'Group of Governmental Experts on Transparency

has since struggled to develop further measures under PAROS. Progress is impeded by two opposing views. Some states, notably China and Russia, insist on a commitment in the form of a binding treaty (first proposed in 2008), while the USA has firmly advocated for a non-binding instrument.[67] The US preference for new instruments dictated solely by political will has resulted in the proliferation of 'soft law' instruments for outer space. While a binding treaty is desirable, such instruments nonetheless hold great potential as a source of law, with the ability to crystallize into international custom.[68] Therefore, even non-binding UN General Assembly resolutions contain legal value, as they represent acceptance of certain legal positions by a majority vote, evidencing opinions of governments in the widest forum for the expression of such opinions.[69]

In 2020 the UK proposed a new resolution on norms for responsible behaviour in space.[70] This initiative could form the basis for future multilateral conversations on space security. The resolution does not introduce specific measures but adopts a new approach that focuses on state behaviour. This is in contrast to past initiatives which have been object-based, for instance the PPWT attempted to define the term 'weapon in space' amid much controversy.[71] Although China, India, Israel and Russia have not voted in favour of the resolution, there is support from 154 countries, which nonetheless indicates a promising path ahead for future dialogue.

Slow progress at the multilateral level has resulted in a growing preference for states to adopt national legislation to clarify regulation (see box 1). Other attempts to introduce non-binding instruments include the EU Code of Conduct for Outer Space Activities, the Hague Code of Conduct against Ballistic Missile Proliferation (HCOC) and the Guidelines for the Long-term Sustainability of Outer Space.[72] Unfortunately, the EU Code of Conduct, although promising, failed to survive multiple rounds of negotiations.

VI. EUROPEAN UNION CODE OF CONDUCT: LESSONS LEARNED

The EU Code of Conduct was a prominent international instrument aimed at clarifying regulation of space activities. This section draws inferences from the substance and process of the Code, as it provides valuable lessons on developing multilateral instruments for space regulation. In 2006 the UN General Assembly adopted a resolution that invited states to submit concrete proposals on TCBMs for outer space amid growing calls to strengthen space security.[73] Workshops were held within the EU to build on this resolution and develop a new multilateral instrument, likely spurred by China's ASAT test in 2007.[74] Discussions culminated in a draft submitted by the EU to the UN in 2008.[75] The Code itself was envisioned as a TCBM that would strengthen existing international obligations while laying the foundation for future policies. The scope of the Code was extremely broad, covering sub-issues of security, sustainability, safety and global cooperation. A prominent advantage of the Code was its ability to act as a precursor to a binding multilateral instrument. Most EU experts contended that a code of conduct would be easier for states to agree to and would also give significant impetus to political processes, citing the HCOC as an example.[76]

However, responses to the process and the substance of the Code were lukewarm. Developing countries felt excluded from the process and contended that the text had been developed on a purely EU agenda. In addition, the USA announced that it would not sign the Code

and Confidence-Building Measures in Outer Space Activities', Note by the Secretary-General, A/68/189, 29 July 2013.

[67] PPWT (note 40).

[68] International Court of Justice, Statute of the International Court of Justice, entered into force 24 Oct. 1945, *United Nations Treaty Series*, vol. 1491, Article 38(1)(b).

[69] International Court of Justice (ICJ), 'Legality of the threat or use of nuclear weapons', Advisory Opinion, *ICJ Reports*, 226, 1996, para. 60; and Brownlie (note 53), p. 15.

[70] UN, General Assembly, 'Reducing space threats through norms, rules and principles of responsible behaviours', A/C.1/75/L.45/Rev.1, 23 Oct. 2020.

[71] PPWT (note 40), Article I(a).

[72] Hague Code of Conduct, 'Preamble'; and UN, Committee on the Peaceful Uses of Outer Space (COPUOS), Guidelines for the Long-term Sustainability of Outer Space Activities, A/AC.105/2018/CRP.20, 27 June 2018.

[73] UN General Assembly Resolution 61/75, 18 Dec. 2006.

[74] See Robinson, J., 'Europe's space diplomacy initiative: The International Code of Conduct', ed. A. Lele, *Decoding the International Code of Conduct for Outer Space Activities* (Pentagon Security International: New Delhi, 2012), p. 27.

[75] Rathgeber, W., Remuss, N.-L. and Schrogl, K.-U., 'Space security and the European Code of Conduct for Outer Space Activities', UNIDIR, 2009, p. 35.

[76] TCBMs are a range of tools employed in international relations for the enhancement of security. In the space context, TCBMs are useful in clarifying intent about the conduct of other states. See Robinson, J., 'Space transparency and confidence-building measures', eds K. U. Schrogl et al., *Handbook of Space Security* (Springer: New York, 2015), pp. 291–97.

because it believed it was 'too restrictive'.[77] The EU held several roundtables with other states between 2008 and 2014 in response to this criticism, and eventually released a revised draft, International Code of Conduct of 2014, to address concerns.[78] Notably, the new draft amended clause 4.2 which initially required states to refrain from 'any intentional action which will or might bring about, directly or indirectly, the damage or destruction of outer space objects unless such action is conducted to reduce the creation of outer space debris and/or justified by imperative safety considerations.'[79] The revised draft instead required states to 'refrain from any action which brings about, directly or indirectly, damage, or destruction, of space objects', unless there was an exception calling for such damage in case of safety or in a state's exercise of self-defence.[80] In such cases, the state ought to minimize creation of space debris 'to the greatest extent practicable.'[81]

The Code also laid down further TCBMs by encouraging notification and information sharing, such as pre-launch notifications and procedures to prevent collisions and harmful interference, in addition to a mechanism for consultations.[82]

The USA adopted a more favourable stance to the new International Code of Conduct and continued to participate in discussions. Negotiations continued into 2015, culminating in a meeting at UN headquarters. Discussions for the Code collapsed entirely at this meeting. Despite its rebranding, Brazil, Russia, India, China and South Africa (BRICS countries) expressed displeasure at being excluded from the drafting process and accused the Code of being 'rather a project by and for the European Union'.[83] The BRICS countries expressed this sentiment in a joint statement at the final negotiations, emphasizing 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 UN.'[84]

Debate on the legal weight of the instrument also reigned. This debate was no longer only concerned with the binding character of the Code, as states began to express concern about the process and its relationship with the UN, since none of the drafts were being adopted by UN mandate.

The identity of the Code was also contentious. There was no clarity on what activities the Code aimed to regulate or what measures it should introduce due to its broad scope. At this juncture, the USA abruptly raised an objection to the language on self-defence, claiming that a state's right to use force in exercise of self-defence had not been captured.[85] This view is questionable, since Article 51 of the UN Charter unequivocally articulates a state's inherent right to use self-defence, and as stated above, this would be applicable to outer space as well through Article III of the Outer Space Treaty.

Dissatisfaction with the Code on these fronts caused negotiations to collapse in 2015. Nevertheless, despite the outcome, the Code of Conduct could prove instructive in the design of future space policy measures, particularly security.

Adopt an inclusive approach

Space security is a highly sensitive issue given the dual-use nature of space, rising competition for commercial activity and geopolitical tensions. States can respond negatively to one-sided framing of a new measure, for example when the EU initially named its initiative the EU Code of Conduct. As noted by experts, the Code unintentionally created the perception that it would limit or even deny technologies to some countries, including developing countries that were just starting their space programmes.[86] Although the EU conducted numerous roundtable engagements with other states for several years following this criticism, and rebranded the code as 'international', the predominant perception in 2015 was that the Code was essentially 'by and for' the EU.[87] The EU could include other states in the drafting process to avoid a similar response, rather than immediately propose a new policy text for negotiation. This would give non-EU member states a

[77] Weisgerber, M., 'US wants changes to the EU Code of Conduct', Spacenews, 12 Jan. 2012.

[78] Council of the European Union, Draft Code of Conduct for Outer Space Activities, 31 Mar. 2014.

[79] Council of the European Union (note 2).

[80] Council of the European Union (note 2), Article 4.2.

[81] Council of the European Union (note 2), Article 4.2.

[82] Council of the European Union (note 2), Article 4.2.

[83] Jakhu and Pelton (note 11), p. 287.

[84] Russian Ministry of Foreign Affairs, BRICS Joint Statement Regarding the Principles of Elaboration of International Instruments on Outer Space Activities, 27 July 2015.

[85] Meyer, P., 'Star-crossed: An international code of conduct for outer space?', Open Canada, 31 Aug. 2015; and Krepon, M., 'Space code of conduct mugged in New York', Arms Control Wonk, 4 Aug. 2015.

[86] Rajagopalan, R. P., 'Achieving global cooperation in space security: Settling for less than the ideal', *Space Security Index 2018*, p. 153.

[87] Jakhu and Pelton (note 11), p. 287.

sense of ownership that could result in broad support for the instrument.[88]

Ensure narrow scope

Space security was not the sole focus of the Code. While one aim was to prevent an arms race in outer space and some provisions hinted at addressing destructive ASAT testing, the language mostly centred on the creation of debris. If a new policy focused exclusively on the harmful effects of destructive ASAT testing and the need to discourage it, the instrument would be both unambiguous and more likely to receive interest. This narrower scope would be a marked difference from the diluted language couched in general terms on space security, which states are already hesitant to pursue due to ubiquitous ambiguities. The new measure should target a specific issue, that is, destructive ASAT testing, and clearly limit the scope of regulation to intentionally creating debris.

Clarify enforceability

There was never any consensus on the legal weight of the Code. When negotiations began, the EU proposed that the Code was a starting point as a voluntary measure. China and Russia continued to argue for a binding new form. States such as the USA were unwilling to commit to any new instrument that limited its power. The attempt to pacify leading powers to achieve consensus may have ultimately resulted in muddling the objective, as none of the states present at the final meeting appeared to have the same stance on what the Code should achieve. A new policy should be clear on the enforceability of the instrument (i.e. binding or non-binding). A new binding multilateral space law instrument appears unlikely despite being desirable. Thus, the new measure would have to be a ‘soft’ law, one that is voluntary for states. If the instrument is voluntary, it will nonetheless have the ability to eventually crystallize into a binding source of customary law if it is complied with by enough countries.

Delineating United Nations involvement

The final meeting for negotiations, which was in 2015, took place at UN headquarters in New York and the UN Institute for Disarmament Research (UNIDIR) and the UN Office for Disarmament Affairs (UNODA) supported negotiations for the Code. It was unclear whether the meeting was officially considered a negotiation under the UN or a consultation between states and this form of passive support confused many stakeholders. The looming question was clear—what did it mean to have the UN host negotiations in the absence of an official UN mandate? If UN support was intentional, then it would have been advisable to negotiate the instrument through a UN General Assembly resolution. Other states may have then considered it an attempt at inclusivity and transparency as they would have an equal vote.

The lessons learned and outlined above from the negotiations of the Code can be instructive in devising future policy measures for space security. These inferences can assist in navigating the dynamics between stakeholders in the international space sector and aid in creating a new policy measure prohibiting destructive ASAT testing.

VII. A BAN ON DESTRUCTIVE ANTI-SATELLITE TESTING

This paper proposes that a new measure should be designed to focus exclusively on prohibiting destructive ASAT testing. The measure should be non-binding, while simultaneously incorporating verification mechanisms. In this manner, the policy would appease both the faction that demands a legally binding instrument and the faction that demands a voluntary instrument. Furthermore, the measure is more likely to be successfully introduced because its scope is only to regulate this form of ASATs, and more specifically this type of testing. The key features of this measure are outlined below.

Clear objective

UNIDIR recently proposed introducing a set of guidelines for ASAT testing. This proposal consisted of three recommendations: ‘No debris, low debris, notification.’ An actor wishing to test ASAT capabilities should not create debris, according to these guidelines, and if they must create debris, the test should be carried out at a sufficiently low altitude to ensure the debris will not be long-lived. The guidelines also suggest that actors notify others of their activities to

[88] Rajagopalan (note 86).

avoid misperceptions.[89] This approach is not ideal, however, as the guidelines continue to provide states scope to conduct destructive ASAT testing. They do not radically incentivize an alteration to state behaviour, or effectively curb testing. Indeed, according to this proposal, India acted responsibly by conducting Mission Shakti at an altitude of 300 km, and generating lower debris, when it could have conducted the test at 1000 km. It is imperative to strive for a complete ban on destructive testing because these tests have devastating consequences for the space environment and fuel global mistrust. Concessions for low debris will result in little change. The new measure should clearly articulate this narrow scope.

Emphasis on collective benefits

Every piece of debris generated from an ASAT test poses a threat to other users' space objects in orbit. The rise of megaconstellations of satellites from companies such as SpaceX, OneWeb and Amazon means a higher use of LEO.[90] Furthermore, objects in GEO appear fixed to the observer on earth, which is extremely valuable. For this reason, states have multiple observation, navigation and communication assets in GEO, which are all equally vulnerable to debris. Protecting assets in GEO is thus a considerable advantage. With the surge in commercial space activities, stakeholders will collectively agree that limiting space debris is desirable. The new measure should emphasize that a ban would accord greater protection to states' assets, particularly in LEO and GEO. A ban thus has the capacity not only to strengthen collective space security, but also to enhance each state's individual security over their space assets.

Incorporating a verification mechanism

While the instrument itself would be built on political will, verification mechanisms should be incorporated into the measure. Notably, China has officially stated that it would be open to discussions on voluntary instruments such as codes of conduct for the space domain.[91] Russia has also expressed an intention to commit to ban destructive ASAT testing.[92] A verification mechanism would give weight to a voluntary ban on ASAT testing. There is more likelihood of states accepting verification in this policy proposal as destructive ASAT tests will not go undetected by other states, particularly those with advanced Space Situational Awareness (SSA) capabilities. For instance, the US military learned of India's ASAT test almost instantly through the military's surveillance network.[93] SSA can therefore be used to verify destructive ASAT testing, not to prevent the offender but to provide a means for information-sharing if a party fails to comply with the ban. The verification clause could suggest that shared SSA will enable observation and reporting amongst the state parties to the instrument only, which also provides an incentive to join the initiative.

Enabling transparency and building trust

There is a great deal of mistrust in relations between states with space capabilities; states that believe an adversarial state is buttressing its own capabilities are likely to prioritize developing their own offensive capabilities. This is evident from the Soviet–US competition to develop ASATs discussed in section III above. The proposed policy measure does not intend to limit *possession* of counterspace capabilities, nor does it prohibit non-destructive testing. By solely regulating debris-generating tests, this policy measure applies to a specific type and use of ASATs. By doing so the measure could introduce transparency as states would not feel compelled to conduct displays of force to threaten or provoke adversaries in response, which in turn has the potential to curtail weapons proliferation. This new proposal, like the Code of Conduct, is a TCBM in itself and would contribute to building trust between rival space powers.

An inclusive approach with narrow focus

By adopting an inclusive approach, the new measure can go a long way in assuring non-Western states that dialogue for space security can be conducted on equal footing, rather than focus exclusively on the inputs of traditional space powers. Furthermore, the scope of the new measure should be restricted to a

[89] Porras (note 19), p. 11.
[90] SpaceX; Starlink; and OneWeb.
[91] Ministry of Foreign Affairs of the People's Republic of China, 'Statement by Director-General FU Cong at the EU Non-proliferation and Disarmament Conference', 13 Nov. 2020.
[92] SpaceWatch, 'Russia's Roscosmos to initiate talks on kinetic kill ASAT ban', 2019.
[93] Erwin, S., 'US Military was immediately aware of India's anti-satellite missile test', 27 Mar. 2019, Space News.

singular defined objective (prohibiting destructive testing only). An example is reflected in discussions between Fu Cong and Christopher Ford, moderated by the EU's Special Envoy for Non-proliferation and Disarmament, Marjolijn van Deelen, at the EU Non-Proliferation and Disarmament Conference 2020.[94] While the tension in China–USA relations was evident during the discussion, both representatives agreed that different approaches to political ideologies cannot be incorporated into discussions on arms control. One way of ensuring that such discussions are contained, rather than expanding to address broad issues of general space security and disarmament, is to narrow the scope of a policy measure to focus only on destructive ASAT testing.

Departing from traditional United Nation processes

There are several weaknesses in existing UN processes. Developing countries have long questioned the fairness of traditional international law and its supporting institutions since there is a clear power imbalance in favour of states on the UN Security Council. In the space context, UN fora such as the Committee on the Peaceful Uses of Outer Space and the Conference on Disarmament have also been slow to achieve progress on legislating space security. Furthermore GGEs are rarely considered adequately representative, usually having fifteen member-country seats of which five are reserved for permanent members. Another weakness is that GGE reports can offer only suggestions and recommendations.[95]

As developing countries have little assurance of a level playing field in an initiative from the West, success for this new proposal through these institutions is doubtful. Rather, a Track 1.5 dialogue could form a starting point, where negotiations with states are conducted through a non-UN institution. The proposal could therefore be one measure that is pursued in parallel to ongoing UN discussions for PAROS. Indeed, this would be an opportunity to build confidence between countries at a time when relations have severely deteriorated.

[94] EU Non-Proliferation and Disarmament Consortium (EUNPDC), Ninth EU Non-Proliferation and Disarmament Conference, 12–13 Nov. 2020.

[95] Rajagopalan (note 91), p. 153.

The European Union as facilitator

This paper proposes that the EU adopts the role of facilitator in the new instrument. This argument is three-pronged.

First, given the critical role of space in the EU, the proposal would introduce further protection for EU space systems. The European space economy employs over 230 000 professionals, and its value was estimated at €46–54 billion in 2014, representing around 21 per cent of the value of the global space sector.[96] The EU is dependent on space for a number of essential services, including telecommunications, transport, emergency services and crisis management. In particular, the information services of Copernicus, the EU's earth observation programme, contribute to the EU Satellite Centre (SatCen), which in turn provides geospatial analysis that is critical for the implementation of the EU Common Foreign and Security Policy (CFSP) and the Common Security and Defence Policy.[97] The Covid-19 pandemic has only further illuminated EU reliance on space assets to track infections, monitor traffic congestion and aid in border crossings.[98] The proposal introduces protection to these critical assets by preventing the intentional generation of new debris. The proposal also dovetails with the CFSP. Calls for a more ambitious and united foreign policy due to geopolitical challenges are linked with a requirement for the EU to protect its space infrastructure and limit the vulnerability of all member states.[99] Furthermore, the proposal aids in achieving dual objectives under the EU space programme for the 2021–27 period to 'enhance the security of the Union and its Member states' and 'promote the role of the Union in the international arena as a leading actor in the space sector and strengthening its role in tackling global challenges.'[100]

[96] European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Space Strategy for Europe, COM/2016/0705 final, 26 Oct. 2016, p. 2.

[97] European Parliament, Policy Department for External Relations, 'The European space sector as an enabler of EU strategic autonomy', Dec. 2020, p. 6.

[98] Copernicus, 'EU space response to Coronavirus', [n.d.].

[99] European Parliament, 'European Parliament resolution of 15 January 2020 on the implementation of the common security and defence policy: Annual report', 2019/2135(INI).

[100] European Commission, Regulation of the European Parliament and of the Council establishing the space programme of the Union and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013, (EU) No 377/2014 and Decision 541/2014/EU, COM(2018) 447 final, 6 June 2018, p. 2.

Second, the proposal specifically provides an opportunity to use space to advance the goal of strategic autonomy.[101] The EU has assumed a passive role in norm-building in space since the Code, despite being affected by domestic policies of third states, especially the USA, with international repercussions. For instance, the US International Traffic in Arms Regulations on export of dual-use technologies directly affect European space operations.[102] Similarly, US Space Policy Directive-3 introduced in 2018 aims to introduce regulation to tackle congestion in space (an issue unresolved at the multilateral level) through the national department of commerce.[103] The implications of this Space Traffic Management policy are that the EU would have to piggyback on US regulations for its own space security needs. A more recent example is reflected in the bilateral arrangements of the Artemis Accords mentioned above. The signing of the Accords by two EU member states highlights the diverging views of EU states on space policy and has been viewed as exposing the EU to allow 'divide and rule' by a third state.[104] This proposal incentivizes the EU to return to its former active status of building norms to enhance its own security rather than continue to allow other states to advance policy on the EU's space assets. In assuming the role of facilitator, the EU could simultaneously promote internal unity and adopt an assertive stance on space security that encourages coordination between its stakeholders.

Third, the EU holds a unique position and would be able to maintain the appropriate balance of power for such a sensitive multilateral initiative. Certainly, the EU has undergone significant transformation from when the Code was first introduced in 2008 to the present day. Unity between member states has weakened and economic fears associated with Brexit and Covid-19 are justified. However, the EU retains its status as a leader in the space sector due to its technical expertise and political standing. Cutting-edge technical expertise for space is available both within the EU and through its partnership with the ESA. While the ESA is an independent entity with UK membership, the ESA and the EU have clearly enlisted 'European autonomy in accessing and using space in a safe and secure environment' as a common objective.[105] The EU as a facilitator would thus have access to such expertise from its partnership with the ESA, in addition to being able to mediate dialogue between opposing non-EU states. This is significant in light of renewed hope for improvement of EU–USA ties and a commitment to returning to multilateral approaches from the new US administration.[106] It is therefore an opportune moment to consider this proposal.

VIII. CONCLUSIONS

This paper has distinguished between the different types of ASATs and has outlined the threats posed by, in particular, destructive ASAT testing with an overview of tests conducted in the past. There is a clear need for targeted multilateral regulation because of the ambiguous legality of these tests under international law and slow or unsuccessful attempts to control these incidents. The Code of Conduct was a notable initiative proposed by the EU and provides guidance in the design of a new measure. Based on lessons learned from the Code, the paper proposes that the EU takes the lead in developing a policy measure to ban ASAT testing with no concessions for debris generation. The measure would be a voluntary and non-binding instrument, but it would incorporate a verification mechanism that can be used by other state parties to the measure.

This ban would aid in creating transparency and building confidence in the space security realm. While the measure does not aim to limit possession of these capabilities, it would prohibit displays of force by space powers that inevitably result in further weapons proliferation among other states. The measure would also enhance cooperation and provide a channel for dialogue facilitated by the EU. Adopting this role would simultaneously assist the EU in achieving its own objectives for the space sector.

[101] European Commission (note 101), p. 8.

[102] As most commercial satellites use US-made components, the International Traffic in Arms Regulations restrict export of critical US technology and limit access to foreign institutional markets which provide low-cost alternatives. See European Space Policy Institute (ESPI), *ESPI Report 75: European Space Strategy in a Global Context* (ESPI: Vienna, Nov. 2020), p. 49.

[103] See Executive Office of the US President, US Space Policy Directive-3, 'National Space Traffic Management Policy', 18 June 2018.

[104] European Parliament (note 102), p. 35.

[105] European Space Agency, Joint Statement on shared vision and goals for the future of Europe in space by the EU and ESA, 26 Oct. 2016.

[106] European Commission, Joint Communication to the European Parliament, the European Council and the Council, 'A new EU–US agenda for global change', JOIN(2020) 22 final, 2 Dec. 2020.

ABBREVIATIONS

ASAT	Anti-satellite
BRICS countries	Brazil, Russia, India, China and South Africa
ESA	European Space Agency
EU	European Union
EU CFSP	European Union Common Foreign and Security Policy
GEO	Geostationary orbit
GGE	Group of Governmental Experts
HCOC	Hague Code of Conduct against Ballistic Missile Proliferation
ITU	International Telecommunication Union
LEO	Low Earth orbit
Liability Convention	1972 Convention on International Liability for Damage Caused by Space Objects
NASA	National Aeronautics and Space Administration
Outer Space Treaty	1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies
PAROS	Resolution on the prevention of an arms race in outer space
PPWT	Treaty on the prevention and placement of weapons in outer space
SSA	Space Situational Awareness
TCBM	Transparency and confidence-building measure
UNIDIR	United Nations Institute for Disarmament Research

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A EUROPEAN NETWORK

In July 2010 the Council of the European Union decided to support the creation of a network bringing together foreign policy institutions and research centers from across the EU to encourage political and security-related dialogue and the long-term discussion of measures to combat the proliferation of weapons of mass destruction (WMD) and their delivery systems. The Council of the European Union entrusted the technical implementation of this Decision to the EU Non-Proliferation Consortium. In 2018, in line with the recommendations formulated by the European Parliament the names and the mandate of the network and the Consortium have been adjusted to include the word 'disarmament'.

STRUCTURE

The EU Non-Proliferation and Disarmament Consortium is managed jointly by six institutes: La Fondation pour la recherche stratégique (FRS), the Peace Research Institute Frankfurt (HSFK/ PRIF), the International Affairs Institute in Rome (IAI), the International Institute for Strategic Studies (IISS), the Stockholm International Peace Research Institute (SIPRI) and the Vienna Center for Disarmament and Non-Proliferation (VCDNP). The Consortium, originally comprised of four institutes, began its work in January 2011 and forms the core of a wider network of European non-proliferation and disarmament think tanks and research centers which are closely associated with the activities of the Consortium.

MISSION

The main aim of the network of independent non-proliferation and disarmament think tanks is to encourage discussion of measures to combat the proliferation of weapons of mass destruction and their delivery systems within civil society, particularly among experts, researchers and academics in the EU and third countries. The scope of activities shall also cover issues related to conventional weapons, including small arms and light weapons (SALW).

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