

IV. Developments in space security, 2020

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The dynamics of space security in 2020 were unsettled by suspicions over state behaviour in outer space. This continued the pattern of 2019, when there was a marked increase in the development and display of counterspace capabilities.¹ Legal ambiguities and an absence of predictability in state behaviour can lead to an increase in militarization and weapon proliferation. This was demonstrated in 2020 by rendezvous and proximity operations (RPOs) and alleged anti-satellite (ASAT) tests.

This section outlines events in 2020 that threatened to undermine international space security. It begins by reviewing RPOs and alleged ASAT tests by Russia and the subsequent responses by other major space powers. It then identifies a growing trend of unilateral policymaking by the United States as a further destabilizing factor due to arbitrary interpretations of international law that are not necessarily equitable. The section concludes with an examination of new initiatives to strengthen space security, recommending a return to multilateral approaches with a reconsideration of traditional institutions through which they may be pursued.

Some of the other defining moments of 2020 each also affected the international space sector. Protests following the murder of George Floyd in the USA led to active steps to improve minority representation in the US space sector.² Worsening climate change led to the increased use of space applications for monitoring and mitigation. Some are lobbying for even greater use of such technologies under the new US administration.³ Space technologies also played a significant role by assisting the health sector in its response to the Covid-19 pandemic by increased use of satellite imagery to track the spread and containment of infections in different locations.⁴ Finally, commercial space activity continued to rise, with companies vying to facilitate connectivity through the introduction of multiple megaconstellations of satellites.⁵

¹ E.g. 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. On developments in 2019 see Porras, D., 'Creeping towards an arms race in outer space', *SIPRI Yearbook 2020*, pp. 513–18.

² Werner, D. and Henry, C., 'How the space sector is responding to the killing of George Floyd', *SpaceNews*, 15 July 2020.

³ Foust, J., 'Biden administration expected to emphasize climate science over lunar exploration at NASA', *SpaceNews*, 9 Nov. 2020.

⁴ Lele, A., 'Coronavirus and space technologies: Satellites to fight with Covid-19', *Financial Express* (Delhi), 3 Apr. 2020.

⁵ E.g. SpaceX's Starlink; and OneWeb.

Thresholds for rendezvous and proximity operations

In February 2020 the USA claimed that Russian satellite Cosmos-2542 had ejected a subsatellite, Cosmos-2543, with the purpose of spying on a US satellite, USA-245.⁶ General John Raymond, chief of operations of US Space Force, labelled the activity as ‘unusual and disturbing’ and potentially threatening behaviour.⁷ These accusations, however, have no legal basis as there is no regulation in international law that defines how such manoeuvres should be conducted. Although USA-245 subsequently moved to create further distance from the Russian satellites, the Russian deputy foreign minister, Sergey Ryabkov, simply stated that ‘Moscow will respond’ and added that these manoeuvres are ‘practices carried out by many countries’.⁸

These manoeuvres fall within the category of rendezvous and proximity operations and they have indeed been frequently conducted by other states, including China, Japan and the USA itself.⁹ RPOs are essentially operations in which one space object is intentionally manoeuvred into the vicinity of another at a given time and location, to accomplish specific objectives. RPOs are therefore used in both civil and military activities in space. While RPOs are traditionally perceived as permitting the gathering of intelligence on an adversary’s satellite, they are also used in other missions, such as docking capsules on the International Space Station and the on-orbit servicing of satellites.

There is no consensus on what constitutes an unlawful RPO or when conduct would be construed as aggressive. The 1967 Outer Space Treaty grants states the freedom to explore and use outer space, and RPOs can be viewed as a legitimate exercise of this freedom, as long as they comply with other provisions of the treaty, in particular the prohibition on ‘potentially harmful interference’ with other states’ activities.¹⁰ States are also required to conduct their space activities in accordance with general principles of international law, including the United Nations Charter.¹¹ Whether a manoeuvre amounts to an unlawful threat or use of force under the UN Charter depends on the facts and circumstances of each case. This includes determining whether the countries are on the brink of conflict, and whether the other satellite was capable of damaging a valuable military asset.

⁶ Hennigan, W. J., ‘Strange Russian spacecraft shadowing US spy satellite, general says’, *TIME*, 10 Feb. 2020.

⁷ Hennigan (note 6).

⁸ ‘US alleges two Russian satellites are stalking one of its satellites’, SpaceWatch.Global, Feb. 2020.

⁹ West, J. (ed.), *Space Security Index 2019* (Project Ploughshares: Waterloo, ON, Oct. 2019).

¹⁰ Outer Space Treaty, articles I and IX. For a summary and other details of the 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) see annex A, section I, in this volume.

¹¹ Outer Space Treaty (note 10), Article III.

In the absence of any clear thresholds for RPOs, mere manoeuvring by one state of a space object in the vicinity of another state's object cannot be fairly characterized as a threat, especially since many states have routinely engaged in this behaviour. However, actual and planned use of RPOs in the commercial sector, especially for on-orbit servicing and debris removal, is growing, and so appropriate thresholds for RPOs are increasingly desirable.

Accusations of anti-satellite tests

Regulatory gaps in space can cause suspicions to fester, resulting in magnified political tensions. This was evident from three incidents in 2020: in April, when the USA accused Russia of conducting a direct-ascent ASAT test; in July, when the US Space Command claimed that Russia injected a new object into orbit from Cosmos-2543; and in December, when it reported another direct-ascent ASAT test by Russia.¹² General Raymond declared that these constituted evidence of weaponization of space by Russia and put the space assets of the USA and its allies at risk.¹³ The head of the United Kingdom's space directorate also voiced concern and stated that the Russian objects had the characteristics of a weapon.¹⁴ Russia responded to the British and US criticism with its own accusation that this was an attempt to present the situation in a 'distorted manner'.¹⁵

Russia was also accused of hypocrisy by the USA in conducting these tests, given the former's diplomatic efforts to introduce restrictions on specific types of weaponization in space.¹⁶ Indeed, Russia has proposed, jointly with China, a draft treaty banning placement of weapons in space.¹⁷ However, the three tests in 2020 were non-destructive—that is, they avoided the generation of debris, unlike earlier ASAT tests by China, India, Russia and the USA.¹⁸ Thus, the British and US criticism was arguably disproportionate.¹⁹

Indeed, the response to a perceived threat in space can be more damaging to international security than the original incident. In this case, the

¹² US Space Command, 'Russia tests direct-ascent anti-satellite missile', 15 Apr. 2020; US Space Command, 'Russia conducts space-based anti-satellite weapons test', 23 July 2020; and US Space Command, 'Russia tests direct-ascent anti-satellite missile', 16 Dec. 2020.

¹³ US Space Command, 16 Dec. 2020 (note 12).

¹⁴ 'Russia satellite: Kremlin accuses US and UK of "distorting" truth', BBC News, 24 July 2020.

¹⁵ BBC News (note 14).

¹⁶ US Space Command, 15 Apr. 2020 (note 12).

¹⁷ Conference on Disarmament, Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (PPWT), CD/1985, 12 June 2014.

¹⁸ On past ASAT tests and the debris generated see Porras, D., *Towards ASAT Test Guidelines*, Space Dossier, File no. 2 (UN Institute for Disarmament Research: Geneva, May 2018). On the debris created by India's Mission Shakti in 2019 see McDowell, J., 'Space activities in 2019', Jonathan's Space Report, 12 Jan. 2020.

¹⁹ E.g. O'Flaherty, K., 'Russian spacecraft stalking US spy satellite sparks espionage fears', *Forbes*, 5 Feb. 2020; and Hitchens, T., 'Raymond rips Russian ASAT test, arms control hypocrisy', *Breaking Defense*, 15 Apr. 2020.

US characterization of this behaviour as ‘threatening’ contributed to the narrative that outer space is becoming ‘weaponized’ and encourages states to fortify their own capabilities.

Since space-based assets are frequently used for military purposes, this narrative is not only flawed, but destabilizing in itself; when a state responds to a perceived threat, there is a tendency to not only strengthen its ability to defend assets, but to also develop offensive capabilities.²⁰ The establishment in December 2019 of the US Space Force and the references to offensive capabilities in the US Space Force Doctrine issued in June 2020 are products of this cycle.²¹ Japan also responded to perceived threats of Chinese and Russian activities through the establishment in May 2020 of a dedicated Space Domain Mission Unit for the defence of its satellites against kinetic and non-kinetic threats.²²

Achieving stability in space security will, in the long term, require regulation that addresses the ambiguities in what is acceptable behaviour in space, while pursuing confidence-building measures among states in the short term to alleviate the impact of this narrative.

A surge in United States unilateralism

During 2020 the USA attempted to further its international space policy through a unilateral approach. This was reflected in three developments. In April President Donald J. Trump issued an executive order that officially rejected space as a global commons.²³ In October the USA and seven other states signed the Artemis Accords, a set of guiding principles for cooperation in civil exploration and use of the Moon and other celestial bodies.²⁴ In September the USA’s space agency, the National Aeronautics and Space Administration (NASA), issued a solicitation for purchase of lunar regolith (soil).²⁵

The Artemis Accords

In May 2020 NASA announced the Artemis Accords as a precondition for other countries that wished to collaborate with the USA in Moon exploration.²⁶ By the end of 2020, nine countries had signed the accords:

²⁰ Grego, L., ‘A history of anti-satellite programs’, Union of Concerned Scientists, Jan. 2012.

²¹ US Space Force, *Spacepower: Doctrine for Space Forces*, Space Capstone Publication (Headquarters US Space Force: Washington, DC, June 2020).

²² Yamaguchi, M., ‘Japan launches new unit to boost defense in space’, *Defense News*, 18 May 2020.

²³ White House, ‘Encouraging international support for the recovery and use of space resources’, Executive Order no. 3914, 6 Apr. 2020.

²⁴ The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets and Asteroids for Peaceful Purposes, opened for signature 13 Oct. 2020.

²⁵ US National Aeronautics and Space Administration (NASA), ‘Purchase of lunar regolith and/or rock materials from contractor’, 10 Sep. 2020.

²⁶ Clark, S., ‘NASA proposals to allow establishment of lunar “safety zones”’, *The Guardian*, 20 May 2020.

Australia, Canada, Italy, Japan, Luxembourg, the United Arab Emirates, the UK and the USA in October and Ukraine in November.

The global response to the accords was mixed. While many welcomed them, many viewed them as a vehicle for arbitrary US influence on international space policy.²⁷ This apprehension can be attributed to the new terminology and concepts introduced by the accords, including safety zones—areas within which signatories commit to notify and coordinate with relevant actors to avoid harmful interference—and ‘deconfliction’ on the Moon, as well as the use of space resources. The concept of safety zones in particular raised security concerns, since the Artemis Accords address them only from the perspective of the party implementing the zone. This has been criticized as potentially creating ‘de facto “spheres of influence”’ that will unfairly empower certain actors (both state and non-state) under the pretext of preventing harmful interference.²⁸

Since none of these issues have been clarified in international forums, the Artemis Accords may pave the way for the USA to unilaterally interpret law, rather than taking a consensus-based multilateral approach.

Purchase of lunar regolith

In September 2020 NASA announced that it was soliciting invitations to collect lunar regolith for a fixed price from commercial entities.²⁹ It claimed that such purchases would be conducted in accordance with international law but, again, the Outer Space Treaty does not expressly discuss the use of space resources.³⁰ The 1979 Moon Agreement makes references to an international framework for the use of space resources, but the USA, like all but a handful of states, is not a party to this treaty.³¹

NASA’s objective in soliciting proposals from both US and foreign companies is most likely to set a precedent for the sale and use of lunar resources. This is an issue that the USA has pursued since it officially recognized that US citizens are entitled to ‘obtain’ space resources in 2015.³²

These policies—Trump’s executive order, the Artemis Accords and NASA’s acquisition of regolith—could erode state relations as they indicate a shift away from the notion that space is for the benefit of all states, and

²⁷ European Space Policy Institute (ESPI), ‘Artemis Accords: What implications for Europe?’, ESPI Brief no. 46, Nov. 2020.

²⁸ Wang, G., ‘NASA’s Artemis Accords: The path to a united space law or a divided one?’, Space Review, 24 Aug. 2020.

²⁹ US National Aeronautics and Space Administration (note 25).

³⁰ National appropriation of outer space is prohibited by Outer Space Treaty (note 10), Article II.

³¹ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement), opened for signature 18 Dec. 1979, entered into force 1 July 1984, Article 11. As of 1 Jan. 2020, the Moon Agreement had 18 states parties; the Outer Space Treaty had 110.

³² Space Resource Exploration and Utilization Act of 2015, Title IV of US Public Law 114–90, signed into law 25 Nov. 2015, section 51 303.

instead suggest that it is becoming exclusionary.³³ When accompanied by US policies that reference ‘space superiority’, they discourage other states from multilateral engagement and may instead lead them to advance their own military ambitions in space.³⁴

The future: Norm-building through inclusive and multilateral approaches

Efforts to address space security issues through the UN—including the Conference on Disarmament (CD), the Group of Governmental Experts (GGE) on Transparency and Confidence-building Measures in Outer Space Activities and the GGE on Further Effective Measures for the Prevention of an Arms Race in Outer Space—have made little progress.³⁵ However, in December 2020 the UN General Assembly adopted a promising new initiative proposed by the UK regarding norms for responsible behaviour in space.³⁶ The resolution does not propose specific regulations but instead invites states to submit their views on aspects of space security to the UN secretary-general, for discussion in the 2021 session of the General Assembly.³⁷ Notably, the resolution departs from the objects-based approach predominant in past multilateral processes (which has resulted in disagreements over defining terms such as ‘weapons in space’). Instead, it aims for future dialogue to focus on state behaviour.

Given the legal uncertainty associated with space activities, developing norms for responsible behaviour in space is certainly the current priority. However, political differences and the need for new regulation to sufficiently address non-state actors in space pose complex challenges. The ultimate goal should be a regulatory approach that incorporates an inclusive multilateral process to adequately represent the views of all entities involved. The onus is on space powers to return to multilateral approaches, engage diverse stakeholders and clarify the intent behind future space activities. In the meantime, confidence-building measures, such as the UK’s General Assembly resolution, can act as key steps towards alleviating the impact of harmful rhetoric surrounding conflict in space.

³³ Outer Space Treaty (note 10), Article 1.

³⁴ US Space Force (note 21), pp. 27–30.

³⁵ United Nations, General Assembly, Report of the Group of Governmental Experts on Transparency and Confidence-building Measures in Outer Space Activities, A/68/189, 29 July 2013; and United Nations, General Assembly, Report of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space, A/74/77, 9 Apr. 2019, annex II.

³⁶ UN General Assembly Resolution 75/36, ‘Reducing space threats through norms, rules and principles of responsible behaviours’, 7 Dec. 2020, A/RES/75/36, 16 Dec. 2020.

³⁷ UN General Assembly Resolution 75/36 (note 36), para. 6.