III. Creeping towards an arms race in outer space

DANIEL PORRAS

The year 2019 was an eventful one for space security, with numerous developments related directly to the United Nations agenda item on the prevention of an arms race in outer space (PAROS). Some states openly declared space to be a domain of war or an area for both offensive and defensive military operations, others announced new dedicated military space units, and another gave a live-fire demonstration of an anti-satellite (ASAT) weapon. All these developments lead to a central question for the international community: Is there already an arms race in outer space?

This question is particularly pertinent given the world's increasing reliance on space capabilities for everyday uses such as weather forecasting, communication, mapping and navigation. This reliance is especially true of modern military forces: satellites are critical for providing telecommunications for troops, reconnaissance and early warning information, and missile targeting capabilities. There is also a trend towards the development of 'counterspace capabilities'; that is, the ability to deny the use and benefits of space systems to an adversary. As relations between major geopolitical rivals are increasingly strained today, the acquisition of tools that deny space services to an opponent are becoming increasingly attractive. Indeed, as the ASAT demonstrations of 2019 indicated (see below), counterspace capabilities are now considered to be a vital part of modern military forces in some states.

While the interest in counterspace capabilities is becoming clearer, the consequences are not. The use of weapons in space could have negative impacts for military rivals—especially those armed with nuclear weapons—but also for everyday civilian uses of space systems. Moreover, the introduction of counterspace capabilities raises concern over the vulnerability of strategic systems. Under certain circumstances, this might prompt some states to think it is more advantageous to strike first.[1] Lack of clarity can lead to misperceptions and miscalculations, which in turn can lead to strategic escalation. In such a case, the consequences of counterspace capabilities could be much more dire on Earth than in orbit.

Against this backdrop, the UN engaged in numerous dialogues throughout 2019 in the hope of finding ways to slow the current trend towards the weaponization of outer space. Unfortunately, political tensions and lack of consensus meant these dialogues had limited outcomes, leaving any progress on preventing an arms race in outer space for 2020 and beyond.

[1] See Arbatov, A., 'Arms control in outer space: The Russian angle, and a possible way forward', *Bulletin of Atomic Scientists*, Special Issue, vol. 75, no. 4 (2019).

2019: A year for anti-satellite demonstrations

Two high-profile events involving the use of counterspace capabilities brought the issue of a possible arms race in space into the spotlight in 2019. In March, the Indian Defence Research and Development Organisation used a ballistic missile interceptor to destroy an Indian satellite in low Earth orbit (roughly 280 kilometres in altitude).[2] This mission, entitled Mission Shakti, demonstrated India's capability to target and strike an object in space. Prime Minister Narendra Modi hailed the mission as an achievement, labelling it as a purely 'defensive' measure that was not directed at any other country.[3] Nevertheless, many experts saw this demonstration as sending a message to China, which has endured strained relations with India in recent years.[4]

The demonstration also showed the difficulty in predicting the behaviour of debris resulting from the use of ASAT weapons. While the Indian authorities predicted that the debris would 'vanish' in 45 days or possibly 'within weeks', almost a year later, 30 per cent of the debris remains, with some debris orbiting at the same altitude as the International Space Station.[5] This debris, which can remain in orbit for years traveling faster than a bullet, puts all resident space objects at risk of collision.

Another activity that received considerable public attention in 2019 involved close-proximity operations by a Russian co-orbital satellite.[6] While the type of satellite is unconfirmed, observers believe it was a small, highly manoeuvrable satellite (drone). Some have speculated it can be used in non-benign ways, including the inspection of other satellites and conduct of espionage operations.[7] Throughout 2019, one of these Russian satellites was observed moving close to commercial and military satellites.[8] While there is no official confirmation or proof that the Russian satellite posed any threat, several countries, including the United States and France, apparently perceived this as a threat from Russia.[9] The result of this perceived threat, as

[2] Indian Government, Ministry of External Affairs, 'Frequently asked questions on Mission Shakti, India's anti-satellite missile test conducted on 27 March, 2019', Press release, 27 Mar. 2019.

[3] Modi', N., 'Address on the successful test of the Anti-Satellite (ASAT) Missile', YouTube, 26 Mar. 2019.

[4] Swami, P., 'India's A-SAT programme born in response to China's growing space capabilities: Understanding Mission Shakti', Firstpost, 8 May 2019; and Rajagopalan, R. P., 'Having tested its ASAT capability, India should help shape global space norms', Observer Research Foundation commentaries, 29 Mar. 2019.

[6] Strout, N., 'Russian satellite creeps up to Intelsat satellite—again', C4ISRNET, 3 Sep. 2019; and Hennigan, W. J., 'Exclusive: Strange Russian spacecraft shadowing US spy satellite, general says', *TIME*, 10 Feb. 2020.

[7] Weedon, B. and Samson, V. (eds), 'Russian co-orbital ASAT', *Global Counterspace Capabilities: An Open Source Assessment* (Secure World Foundation: Washington, DC, Apr. 2019), section 2.1.

[8] Analytical Graphics, 'Episode 14: LUCH space activities', YouTube, 26 June 2019.

[9] Parly, F., French Defence Minister, 'Présentation de la stratégie spatiale de défense' [Presentation of the strategy spatial defence], Airbase 942, Lyon, 25 July 2019; and US Mission to International Organizations in Geneva, 'Statement by Assistant Secretary Poblete at the Conference on Disarmament', 19 Mar. 2019.

well as others, is that several countries are preparing for conflict in space. Importantly, the use of co-orbital satellites is not restricted to Russia.[10] The USA, for example, also possesses these capabilities. However, US satellites did not receive the same attention throughout 2019 as the Russian drones. This is partly because US co-orbital satellites are not listed in the US catalogue of space objects. Moreover, the companies able to publicly release information about Russian proximity operations involving drones are US companies and make it a policy not to track unlisted US objects.[11]

New policies on military space operations

While the operations mentioned above drew considerable attention to the threat of arms in space, the issues surrounding PAROS became even more visible to the public eye after some major states revised their national policies on space. This trend began in 2017, when US President Donald J. Trump first proposed a Space Force: a dedicated military unit whose sole function is to ensure the integrity of US military space systems. The US Space Force (USSF) was officially established in December 2019, 'within the Department of the Air Force, meaning the Secretary of the Air Force has overall responsibility for the USSF, under the guidance and direction of the Secretary of Defense'.[12] While the functions of the USSF are not radically different from earlier iterations that existed within the US Air Force, the geopolitical signalling was not lost on rivals and adversaries in space. Russia, for example, stated that it needed to develop its own space forces further in response.[13] The strong reactions by rival countries, however, may have more to do with President Trump's rhetoric accompanying the establishment of the Space Force—described as being to 'safeguard American dominance in space'—as opposed to the actual mandates of the unit.[14] Nonetheless, this step combined with the establishment of the Pentagon's Space Development Agency, whose main function is to find new military space capabilities, also raises some concerns

[10] Weedon and Samson (note 7), 'Chinese co-orbital ASAT', section 1.1, and 'US co-orbital ASAT', section 3.1.

[11] Hall, B., Analytical Graphics, Presentation at the UNIDIR event 'Navigating space: Charting a course for a sustainable space environment', United Nations, New York, 28 Oct. 2019.

[12] US Space Force, 'US Space Force fact sheet', 20 Dec. 2019; and Erwin, S., 'Trump signs defense bill establishing US Space Force: What comes next', *SpaceNews*, 20 Dec. 2019.

[13] BBC, Reality Check Team, 'Russian president warns over expansion of US space force', 4 Dec. 2019; and Associated Press, 'China attacks US Space Force as threat to peace', Air Force Times, 23 Dec. 2019.

[14] White House, 'President Donald J. Trump is launching America's Space Force', Fact sheet, 23 Oct. 2018; and White House, 'Donald Trump signs Space Force directive in the Oval Office', Remarks, 19 Feb. 2019.

that the USA is pursuing new weapons for space, including for offensive purposes.[15]

Other countries also began a process of changing their military postures in space. For example, not long after Mission Shakti, in April 2019 India formally established its Defence Space Agency and in June 2019 it announced a Defence Space Research Organisation, with a mandate to protect India's space capabilities and to act as a deterrent against foreign interference.[16]

Both France and Japan reacted to the activities of the Russian co-orbital drone described above by announcing their own changes to posture in space. In July 2019, French President Emmanuel Macron announced that France would adopt a new space doctrine and establish its own space command within the French Air Force.[17] The purpose of this new policy was to develop four areas of French activity in space: 'space service support, situational awareness, operations support and active space defence'.[18] On the last point, France also declared its intention to explore mounting 'defensive' measures on certain military satellites, including high-energy lasers.[19] Such lasers could be used on a co-orbital satellite encroaching on a sensitive French military satellite. Similarly, the Japanese Government announced that it would be establishing a space unit in its Self Defense Forces, with plans to deploy 'guardian drones' to engage other hostile space objects. [20]

These policy announcements were not restricted to national governments. The North Atlantic Treaty Organization (NATO) announced that outer space is now a domain of operations, and that an 'attack' on a satellite belonging to an allied state would be considered sufficient to trigger collective defence under Article 5 of the Washington Treaty.[21] NATO stressed that it did not have plans to weaponize space and that this policy shift was intended to protect space services for NATO military missions. However, NATO did not offer any clarity on what it considered to be an 'attack' on a satellite, although jamming and physical harm appear to constitute one. Indeed, there does not appear to be any consensus among NATO states, let alone non-NATO states, as to what constitutes an 'attack' on a space object.

All these developments put space activities, and specifically space security, much more in the public eye than in years past. This attention comes with the growing concern that it is only a matter of time before open conflict

[15] Mehta, A., and Insinna, V., 'Pentagon officially stands up Space Development Agency, names first director', *Defense News*, 13 Mar. 2019.

[16] Raghuvanshi, V., 'India to launch a defense-based space research agency', *DefenseNews*, 12 June 2019; and Lele, A., 'India's growing clamour is space and why the country needs a separate Space Force', *Financial Express*, 2 Aug. 2019.

[17] Reuters, 'France to create space command within air force: Macron', 13 July 2019.

[18] French Ministry for the Armed Forces, *Space Defence Strategy: Report of the 'Space' Working Group* (French Government Publishing Office: Paris, 2019), p. 10.

[19] Parly (note 9).

[20] *Japan News*, 'SDF space unit set to launch in FY20', 5 Aug. 2019.

[21] Banks, M., 'NATO names space as an "operational domain," but without plans to weaponize it', *DefenseNews*, 20 Nov. 2019.

emerges in space. Moreover, the physical properties of space are such that the consequences of a conflict could affect all users of space services. For example, the surge in resident space objects in low Earth orbit and the constant addition of new space activities in 2019 means the potential impact of space debris could be considerable. That makes 2019 a particularly worrying year for space security.

Recent efforts at the multilateral level and the challenges ahead

Member states of the UN held numerous talks, on both security and safety aspects of space activities, with a view to finding paths towards new measures (or the strengthening of existing ones) to minimize the likelihood of open conflict in outer space.

The Conference on Disarmament (CD), the international negotiating body on arms control and disarmament, sought to re-establish subsidiary bodies on individual agenda items. This approach, previously adopted in 2018, is a means of moving beyond the blockage that has prevented the CD from adopting a programme of work for nearly 20 years. In 2018, Subsidiary Body 3 looked at PAROS and was able to produce a report that outlined areas of convergence where the international community might be able to work.[22] Unfortunately, external political reasons meant that the CD was unable to reach a decision in 2019 to reconstitute the subsidiary bodies; as a consequence, no substantive work was done throughout 2019 in relation to PAROS.

Another initiative that began in 2018 and concluded in 2019 was the Group of Governmental Experts (GGE) on further practical measures for PAROS. This GGE first met for a two-week session in August 2018 and again for an intersessional meeting in New York on 31 January 2019, at which the Chair of the GGE presented a report on his findings thus far.[23] This report laid out two distinct approaches under discussion: one focusing on the prohibition of technology and the other on the prohibition of behaviours. It also presented several scenarios that served to highlight the types of threats that might disrupt the space environment, such as co-orbital vehicles and ASAT missiles. The GGE continued its work at its second two-week session in March 2019 but, despite considerable efforts, was unable to reach consensus on a final report. The draft of the report was released, however, when the Africa Group made it publicly available in a statement to the UN Disarmament Committee (UNDC) in April 2019.[24]

[22] United Nations Conference on Disarmament (CD), 'Report of Subsidiary Body 3: Prevention of an arms race in outer space', CD/2140, 11 Sep. 2018.

[23] Group of Government Experts on PAROS, 'Report by the Chair of the Group of governmental experts on further practical measures for the prevention of an arms race in outer space', 31 Jan. 2019.

[24] United Nations Disarmament Committee, Nigeria (on behalf of the African Group), 'Recommendations to promote the practical implementation of transparency and confidence-building measures in outer space activities', Working paper, A/CN.10/2019/WP.1, 25 Apr. 2019.

Finally, in 2017 the UNDC established a Working Group in accordance with its three-year work programme, which includes voluntary measures such as 'transparency and confidence building measures' (TCBMs) for space activities. This Working Group was unable to meet formally in 2019 due to political issues. However, it did manage to hold a brief informal session, during which the Africa Group issued the above-mentioned statement. It is unclear if the UNDC will be able to meet in 2020.

The difficult relations between certain UN member states were also evident from the resolutions adopted by the 74th Session of the UN General Assembly. The resolution on TCBMs (usually adopted without a vote) was adopted by vote for the second year in a row, with the USA and Israel both voting against.[25] The USA also voted against Resolution 74/32 on PAROS, although in the past it has abstained.[26] Most notable, however, was Resolution 74/34 on 'Further practical measures for the prevention of an arms race in outer space', which now includes a new reference to one of the key sources of concern related to PAROS: '*Expressing serious concern* over the plans declared by certain States that include the placement of weapons, in particular strike combat systems, in outer space'.[27] Resolution 74/34 was adopted by a considerable majority, although with more abstentions than other space-related resolutions. This resolution is also significant because it calls on the CD to take into account the work of the GGE on PAROS, in the form of the draft report that was never agreed to by consensus. It remains to be seen if a new GGE will continue working on PAROS.

Following the developments of 2019, it is not clear how UN member states can achieve consensus on the issues around PAROS. While the CD remains the most likely venue for discussions, the political deadlock makes progress on any issue difficult. Meanwhile, there are clear indications that the major military powers will continue to seek counterspace capabilities where feasible, anticipating that no diplomatic solutions will emerge to protect space objects. Although it is not yet inevitable that open conflict will emerge in space, the signs are becoming more obvious that there is an arms race underway among major geopolitical rivals, and that space will play a considerable role in this arms race. The challenge is to find ways to dampen an arms race that targets space objects and systems, and to mitigate the harmful effects on non-rival parties. If a solution is not found, space may become a source of strategic unpredictability, with destabilizing consequences on earth.

[25] United Nations, General Assembly, Resolution 74/67, 12 Dec. 2019. Votes were 173–2–6 (for–against–abstentions).

[26] United Nations, General Assembly, Resolution 74/32, 12 Dec. 2019. Votes were 183–2–0.

[27] United Nations, General Assembly, Resolution 74/34, 12 Dec. 2019, Preamble. Votes were 131–6–45 (for–against–abstentions).