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Implications of Military and Security Uses of Outer Space

Cassandra Steer

If you have not already seen the excellent film *Eye in the Sky*, in which Helen Mirren plays a British colonel dealing with moral, political, and legal dilemmas as she leads a drone strike in Kenya, I highly recommend you do. Apart from its exceptional presentation of some of the most difficult issues of modern warfare, it is also an accurate depiction of just how dependent modern militaries are on space technologies. The Internet and satellite communication links between military operators and politicians in China, Hawaii, Kenya, the United Kingdom, and the United States are crucial to the highly time-sensitive decision-making chain. Thanks to satellites, images are relayed from tiny robots in Kenya to various players in their different international locations, the drone in Kenya is flown by operators in the United States, and the launch of the weapon from the drone is GPS-guided. Today's military and security activities in space include intelligence, surveillance, and reconnaissance; disaster response; tracking the movement of refugees; identifying evidence of war crimes or other mass human rights violations; and tracking climate changes. The policy and legal implications of these military and security uses of space are no longer a matter of a futuristic *Star*

Wars scenario; rather, there are multiple challenges that recently have come to the forefront of growing tensions between the world's major powers. China, Russia, and the United States have demonstrated anti-satellite weapon (ASAT) capabilities, and active space defense has entered the policy rhetoric in India, Israel, and Japan. The most technologically advanced states have the most to lose if their space assets are disabled or targeted—if we lose the satellite systems that listen and observe, we are severely inhibited. Although space was envisaged to be a global commons, in recent years there have been policy shifts that reflect the desire to exert a more dominant presence in outer space, with more proactive, aggressive space security strategies. The notion of a global commons has come under threat, and there is a risk of an emerging space arms race and even of a conflict in space. There is, therefore, a renewed need for restraint in space for both national and global security and for more clarity on the ways in which military and security activities are limited by existing international law.

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This article will first map out the legal framework governing space as a global commons and then identify the policy shifts that have led to recent tensions. The need for a policy of renewed restraint in space will then be discussed, because any destructive activities in space affect all nations, not just those

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actively engaged in tensions or hostilities. The article will conclude by identifying avenues to clarify the applicable international law.

Space as a Global Commons

The notion that outer space should remain a peaceful sanctuary where no nation-state could lay claim to sovereignty was enshrined in the 1967 Outer Space Treaty (OST).¹ Article I states that the use of outer space “shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.” There is no definition given for the term “province of all mankind,” and it differs from the terminology used in other global commons legal regimes, such as the high seas, deep seabed, and Antarctica.² However, the general intent is reflected further in the OST. Article II determines that space shall not be subject to national appropriation and, therefore, can never be the territory of any state nor the property of any entity; Article III emphasizes that all activities in space must be in accordance with international law and “in the interest of maintaining international peace and security and promoting international cooperation and understanding.”

This establishment of outer space as a global commons was a product of the Cold War. Following a series of arms tests in space, both the United States and the USSR realized that if they wanted to continue to have access to space for intelligence, reconnaissance, and surveillance purposes, they would need to come to some compromises as to its use. The competition to be the dominant power in space began with the USSR’s launch of Sputnik in 1957. Both powers vied for technological dominance, conducting various nuclear tests in the

upper atmosphere and lower Earth orbits. Perhaps the worst of these was the 1962 Starfish Prime test launched by the United States, which exploded a 1.4 megaton hydrogen bomb at an altitude of 248 miles and disabled at least six satellites, including British, American, and Soviet TV broadcast and telecommunications satellites.³ It also affected radio transmissions from California to Australia for several hours, making clear at once that a conflict in space would have far-reaching consequences for all countries, even neutral ones.

This and other tests led both superpowers to realize that although space could be seen as the ultimate “high ground” in military terms,⁴ where a technological advantage out of reach of an adversary’s firepower would mean dominance in space and on Earth, at the same time the unique nature of the environment meant that weaponization could endanger each state’s own sovereign interests as much as any adversaries. A cooperative restraint emerged in the late 1960s and early 1970s, reflected in the rapid emergence of an international legal regime to protect the collective interest in this global commons. Alongside the OST there are four other core space treaties, all negotiated under the auspices of the UN Committee on Peaceful Uses of Outer Space.⁵

This protective legal regime gained wide international support, with many nations signing these treaties even before they had built their own space capabilities. There was a desire to protect future access to and use of space, for international telecommunications, broadcasting, and military uses, and there was consensus that this would require international cooperation.

In this light, Article IV of the OST prohibits the placement of nuclear weapons or other weapons of mass destruction in orbit around the Earth and declares that the moon and all other celestial bodies shall be

used for “exclusively peaceful purposes.” However, there has been general acceptance that this does not exclude nonaggressive military uses, such as early warning detection of missile launches and “national technical means of treaty verification”—that is, imaging surveillance of the nuclear arsenal of the adversary. These activities were seen as an important aspect of deterrence in the nuclear arms race.⁶

From Global Commons Sanctuary to Weaponization of Space

Despite the international support for the doctrine that space should remain a sanctuary,⁷ as American-Soviet power relations shifted, the space priorities of those nations—and the mutual incentives to preserve space as a sanctuary—changed. Under the Reagan administration, intimations of space-based ballistic missile defense led to the imagining of the ill-famed “Strategic Defense Initiative” program. The underlying belief was that the Cold War could be won on Earth through a geopolitical advantage above by creating an active defense capability in space. Critics of this “high-ground” approach argue that explicit weaponization of space could trigger the very arms race that the OST and its “peaceful purposes” axiom were intended to prevent.⁸

Thankfully, we have never seen such an extensive space-based weapons system; however, space has become a high ground in a different sense, and a new arms race may well be under way. The First Gulf War, which took place twenty-five years ago, is often referred to as the first “space war,” as it was the first time these space technologies were so highly integrated into strategic, tactical, and operational procedures. Today, space systems provide integral support for warfare on land, at sea, and in the air for militaries around the

world. This critical dependency on space capabilities leads to vulnerability. The best way to cripple an adversary is to take out the satellites that provide images and communications capabilities. This Achilles’ heel incentivizes competing powers to develop the capacity to target these space assets and reduce the advantage of this high ground. This vulnerability has increased over recent decades, as space is no longer the domain of a very few superpowers, and the number of space-faring and space-capable nations has continued to grow, including the European Union (EU), China, India, Iran, Japan, South Korea, and potentially North Korea.

The demonstration of ASAT capabilities by various states has exacerbated these tensions. Although to date these have all been launched from Earth (ground, sea, or air), and do not amount to weaponization of space, the fact that the capability has been demonstrated is enough to raise concerns that space is no longer the high ground once envisioned. Already in 1963, the Soviets had tested co-orbital interceptors, which were launched from Russian territory and met a satellite on its orbit before detonating to destroy it.⁹ In 1985 the United States destroyed one of its own defunct satellites by launching a missile from an F-15 aircraft,¹⁰ and in 2008 it launched a sea-based missile and destroyed another one of its own satellites.¹¹ In 2007 China launched a ground-based missile with a homing device, destroying an old Fengyun FY-1C weather satellite, creating an estimated 3,000 pieces of trackable debris and an unknown number of smaller pieces, most of which will remain in orbit for about fifty years.¹² Such space debris is itself a critical security issue, since even very small pieces can cause serious damage to satellites owing to the velocity at which they are orbiting and the high density of orbital traffic at these altitudes. Despite this disastrous outcome, in 2010 India announced

it would develop a similar “hit to kill” ASAT.

The high risk of causing more space debris—which is a problem for everyone’s secure and safe use of space—has led to the development of more covert ASATs, many of which are space-based. For example, genuine efforts to develop technologies to deal with the problem of space debris may also be employed for less benign purposes. Once it becomes possible to capture a defunct satellite, it would also be possible to capture an adversary’s working satellites. Similarly, the ability to service a satellite in orbit might be employed to interfere with a satellite. Concerns were raised in 2014 that Russia was conducting such a test when it launched a communications satellite, which subsequently released an unidentified object that began to make deliberate maneuvers toward other satellites.¹³ In 2015 the United States tested its military space plane, the X-37B; while its actual purpose is unclear, there are speculations that it is another form of covert weaponization of space.¹⁴ There are also many incidents of deliberate interference with a satellite, by way of cyber attacks affecting the relay of data, “dazzling” the imaging equipment, or “jamming” the radio signals, all known as “soft kill” weapons.¹⁵

A new arms race in space appears to be building, coupled with media hype that space is the inevitable new battlefield.¹⁶ Recent policy shifts represent a push toward control and dominance in space by denying adversaries equal access and capabilities. Despite the 2010 US National Space Policy calling for more collaboration and cooperation, the National Defense Authorization Act for 2015 called for the development of “offensive space control and active defensive strategies and capabilities.”¹⁷ This was a return to a more antagonistic rhetoric, reflective of the belief that “whoever has the capacity to control the air is in a position

to exert control over the land and seas beneath [and] . . . whoever has the capacity to control space will likewise possess the capacity to exert control over the surface of the earth.”¹⁸

Recent policy shifts represent a push toward control and dominance in space.

But as space security expert James Clay Moltz has pointed out, the notion of a hegemon in space cannot be fulfilled the way it has been in the past in a terrestrial context.¹⁹ Given broad acknowledgment of the collateral consequences of aggressive actions in space, other nations will likely pose a serious obstacle to a potential upstart, leading to further competition. There is also the unusual moderating effect of non-state commercial actors in space, which are increasingly influential in providing space services for both civilian and military needs. Since the launch and continued operation of a satellite is prohibitively expensive, many launches include a shared payload of military and civilian satellites. Moreover, many satellites are “dual use,” providing services for both military and civilian purposes. The Global Positioning System (GPS) was a military invention, and we now use it to navigate our way around a city, and much of the Internet and communications we use are provided to the military as well. These commercial entities now have a vested interest in the security of space. All of this means we must consider more sustainable options for responding to security threats in space.

The Need to Return to Restraint and Collaboration

Space is now understood to be “congested, contested, and competitive,”²⁰ meaning that

while it is important for nations to have the ability to deter attacks and to replace any systems that are attacked, it is not possible to exert singular control over space. The large number of actors in space and our daily dependence on space technologies necessitate the promotion of long-term and sustainable use of space.

General John E. Hyten, who leads the US Air Force Space Command, has stated that “no one wants a conflict that extends into space or cyberspace, but we must be prepared for when and if it does.”²¹ However, this does not have to mean an aggressive stance, which is bound to exacerbate a self-fulfilling arms race. Rather, as was recently proposed by Joan Johnson-Freese and Theresa Hitchens in their Atlantic Council Policy Paper, there must be an emphasis on strategic restraint and space diplomacy in order to protect the highly complex space environment, which is used by and must be managed by a wide range of international players.²² The answer must be diplomacy first, technology next. Otherwise, there is no exit route from an arms race. If the United States is attempting to gain dominance in space, we cannot expect China or Russia to withhold from the same attempt.

If we want to continue to have freedom of access to space, even for military activities, we must return to the notion of a global commons and develop strategies for ensuring responsible behavior in space by all actors. One of the challenges in the space domain is identifying intent and attribution when there is known interference with a satellite—was it caused by natural phenomena, by space debris, or by the deliberate actions of an adversary? International agreement on a common set of guidelines and principles can ensure more players will act responsibly and can also make it easier to identify exactly what amounts to deliberate irresponsible behavior and to accurately attribute

such behavior to rogue actors, in turn making it easier to respond appropriately. As the US Deputy Assistant Secretary of Defense for Space Policy has stated, “Over time, this should discourage destabilizing, irresponsible acts, such as China’s 2007 test of an antisatellite weapon.”²³

Furthermore, collaboration and transparency must be emphasized among nations with existing tensions. While this may seem counterintuitive, China has joined the call for this at the recent meeting of the UN Working Group on the Long-Term Sustainability of Outer Space Activities.²⁴ Russia remains the only outlier in the international consensus that increased transparency is the best guarantee against a conflict in space.

The Need to Clarify International Law Applicable to Military Activities in Outer Space

The final piece to the puzzle is clarifying the international law that applies to these activities as the limiting normative framework. Opinions are mixed as to how existing law on the threat or use of force, the law of armed conflict, and environmental law should apply in outer space. None of these frameworks were written with outer space in mind, and yet, as our military and security activities continue to increase in this domain, clarifying the parameters will aid in de-escalating the current rising tensions. Article III of the OST stipulates that all activities in outer space must be in accordance with international law; however, what precisely this entails, with respect to military activities, is still a matter of debate.

The final piece to the puzzle is clarifying the international law that applies to these activities, as the limiting normative framework.

Just last year, attempts to negotiate a non-binding International Code of Conduct for Outer Space Activities hit a very disappointing wall and have been declared by many a total failure. This was due partially to disagreements over the necessity of including reference to the “inherent right of self-defense in space,” which was the preference of the United States amid other nations, whereas others were concerned this would raise the likelihood of certain nations claiming this right and exercising a first strike. It was also partially because many states felt they were not fully included in the drafting and negotiation process. These highlight the need for truly multilateral engagement and respect for the original intention of a global commons.

Another struggling international initiative is the attempt at the UN Conference on Disarmament to negotiate a draft Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects (PPWT), which has been cosponsored by Russia and China.²⁵ The greatest challenge faced by this initiative is resistance by Australia, Canada, France, and the United States, all of which maintain that their opposition is due to the lack of a verification mechanism. However, such a mechanism need not be built into a framework treaty, it could always come as a later protocol, allowing the development of clear arms control norms in space. It would seem there are other political motives behind this pushback, which were also evident in some of the discussions surrounding the failed International Code of Conduct (ICoC), namely, that these states do not want to agree to international norms that might limit their activities in the current re-surfing arms race in space.

Private actors have therefore begun to take up the project of reducing tensions where sovereign actors left off. One important

initiative is the project to develop a Manual on International Law Applicable to Military Activities in Outer Space (MILAMOS),²⁶ which is being spearheaded by the McGill Institute of Air and Space Law in collaboration with the University of Adelaide Research Unit on Military Law and Ethics. It brings together internationally renowned experts to draft a neutral document that identifies the law, in the footsteps of the San Remo Manual on Sea Warfare,²⁷ the Harvard Manual on Air and Missile Warfare,²⁸ and the Tallinn Manual on Cyber Warfare.²⁹ These manuals have been incorporated into national military manuals and are in the hands of military legal advisors during tensions and hostilities. They, therefore, affect decision making and, potentially, the formation of customary law through state practice and explicit agreement that their content reflects the law.³⁰ Such a neutral framework is an important step toward clarifying the law on the use of force and the law of armed conflict as applicable to outer space. This may help to de-escalate in situations of tension and to reduce the impact and extent of an actual conflict, should that occur.³¹

There is a renewed need for restraint in space for both national and global security and for more clarity on the ways in which military and security activities are limited by existing international law, even if this was not codified in the 1967 treaty. This return to the notion of space as a global commons and the negotiation of international norms on responsible behavior is our best bet to avoid a conflict in space and to maintain access to and use of space for future generations, even in times of political instability, such as we are arguably faced with today.

Notes

1. *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, January 27, 1967, 610 UNTS 205, Articles I, II and IV.
2. Stephan Hobe, "Article I," *Cologne Commentary on Space Law* 1 (2009): 28–29.
3. James Moltz, *The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests* (Palo Alto, CA: Stanford University Press, 2011), 119.
4. David E. Lupton, *On Space Warfare: A Space Power Doctrine* (Maxwell AFB, AL: Air University Press, 1988), 21.
5. *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space*, April 22, 1968, 672 UNTS 119; *Convention on the International Liability for Damage Caused by Space Objects*, March 29, 1972, 961 UNTS 187; *Convention on Registration of Objects Launched into Outer Space*, January 14, 1975, 1023 UNTS 15. The final space treaty, the Moon Agreement, has only sixteen states party, among them only France, India are truly space-faring nations. For this reason it is often seen as an obsolete treaty.
6. Lupton, *On Space Warfare*, 20.
7. *Ibid.*, 30.
8. *Ibid.*, 57.
9. Laura Grego, "A History of Anti-Satellite Programs," *Union of Concerned Scientists* (January 2012): 3.
10. Moltz, *Politics of Space Security*, 202.
11. Grego, "History of Anti-Satellite Programs," 4.
12. James Moltz, *Crowded Orbits: Conflict and Cooperation in Space* (New York: Columbia University Press, 2014), 30.
13. Paul Rincon, "Russia Tests 'Satellite Catcher,'" <http://www.bbc.com/news/science-environment-30097643> (date accessed: August 17, 2016).
14. Subrata Ghoshroy, "The X-37B: Backdoor Weaponization of Space?," <http://thebulletin.org/2015/may/x-37b-backdoor-weaponization-space8292> (date accessed: August 17, 2016).
15. Cassandra Steer and Dale Stephens, "Conflicts in Space: International Humanitarian Law and Its Application to Space Warfare," *Annals of Air and Space Law* 40 (2016): 7.
16. Rejeanne Lacroix, "Space, the Next Frontier of Security : Is Canada Ready?," <http://natoassociation.ca/space-the-next-frontier-of-security-is-canada-ready/> (date accessed: August 17, 2016); Lee Billings, "War in Space May Be Closer Than Ever," <http://www.scientificamerican.com/article/war-in-space-may-be-closer-than-ever> (date accessed: August 17, 2016); Patrick Tucker, "Pentagon Rushing to Open Space-War Center to Counter China, Russia," *Defense One*, June 23, 2015; Ari Yashar, "US and China Gear Up for Space Combat," <http://cosmoso.net/us-and-china-gear-up-for-space-combat/> (date accessed: August 17, 2016).
17. Howard P. "Buck" McKeon *National Defense Authorization Act for Fiscal Year 2015* Public Law 113–291: 1607.
18. US General Thomas White, address to the National Press Club on November 29, 1957, quoted in Lupton, *On Space Warfare*, 21.
19. Moltz, *Crowded Orbits*, 181.
20. US National Security Space Strategy, Unclassified Summary, <https://fas.org/irp/eprint/nsss.pdf> (date accessed: August 17, 2016).
21. Air Force Space Command, Commander's 2016 Strategic Intent, <http://www.afspc.af.mil/> (date accessed: August 17, 2016).
22. Joan Johnson Freese and Theresa Hitchens, *Toward a New National Security Space Strategy: Time for a Strategic Rebalancing*, <http://www.atlanticcouncil.org/publications/reports/toward-a-new-national-security-space-strategy-time-for-a-strategic-rebalancing> (date accessed: August 17, 2016).
23. Gregory L. Schulte and Audrey M. Schaffer, "Enhancing Security by Promoting Responsible Behavior in Space," *Strategic Studies Quarterly* 6, no. 1 (January 2012): 9.
24. Committee on the Peaceful Uses of Outer Space, "Draft Report, Annex II, Report of the Working Group on the Long-Term Sustainability of Outer Space Activities," presented to Committee on the Peaceful Uses of Outer Space Scientific and Technical Subcommittee in Vienna, <http://www.unoosa>

- .org/res/oosadoc/data/documents/2016/aac_105c_1lts/aac_105c_1lts2016l_1_0_html/AC105_C1_LTS_2016_L01E.pdf (date accessed: August 17, 2016).
25. *Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects*. <http://reachingcriticalwill.org/images/documents/Disarmament-fora/cd/2014/documents/PPWT2014.pdf> (date accessed: August 17, 2016).
 26. "What Is the MILAMOS Project?," <https://www.mcgill.ca/milamos/> (date accessed: August 17, 2016).
 27. San Remo Manual of International Law Applicable to Armed Conflict at Sea (1995) 309 *International Review of the Red Cross* 583.
 28. *Harvard Manual of International Law Applicable to Air and Missile Warfare*, Program on Humanitarian Policy and Conflict Research at Harvard University, ihlresearch.org/amw/HPCR%20Manual.pdf (date accessed: August 17, 2016).
 29. "Tallinn Manual," <https://ccdcoe.org/research.html> (date accessed: August 17, 2016).
 30. I have had off-the-record discussions with military legal advisors of various countries who state that they have cited the San Remo Manual and the Harvard Manual, even when the rules stated in these manuals are incorporated into their national military manuals. The Tallinn Manual is too recent to know its real impact.
 31. Ram Jakhu, Cassandra Steer, and David Chen, "Conflicts in Space and the Rule of Law," *Space Policy* (forthcoming, 2016).