Implications of New Space Forces for Sustainable Space and Terrestrial Security

By Nayef Al-Rodhan - 19 February 2021

Nayef Al-Rodhan on why space should be treated a global commons and new cooperation mechanisms are needed to ensure this asset benefits all.

The United States Space Force was established in December 2019, drawing on a long history in space capabilities at the US Air Force. The US Space Force, however, is an independent branch and military service, and as of February 2021, it has specific rank names. Several countries around the world including China, France and Russia have institutional structures akin to a space force. The future relations between these space forces will have significant implications for global security, and the consequences can be especially negative if current trends of operationalizing outer space continue, including increased militarization and weaponization.

In this article, I provide an overview of the current capabilities of space forces as well as potential risks to security in space and in the terrestrial realm. Employing a framework I developed previously, Meta-Geopolitics, I analyze outer space as a strategic asset, critical to every aspect of modern life and warfare. Thereafter, reflecting on the stakes of outer space security, it is critical to move beyond the theory of Realism. The paradigms of Symbiotic Realism and Multi-sum Security provide further conceptual grounds to reflect on current and emerging trends in outer space security.

Space as a Strategic Asset

My framework of Meta-Geopolitics holds that state power and legitimacy are defined by seven state capacities: social and health issues; domestic politics; economics; the environment; science and human potential; military and security issues; and international diplomacy. Outer space is critical for all seven state capacities.

In the social and health sector, satellites are crucial for remote delivery and communications, disease monitoring, remote training of medical staff, and the integration of population from remote areas in healthcare systems. In China, the use of drones during the COVID-19 pandemic relied, among others, on space assets.

In domestic politics, space assets assist in border control and surveillance. Moreover, space activities have been historically associated with national prestige. The launch of the US Space Force also included the unveiling of the space force flag, meant to instill national pride.

Space is also a critical domain for the economy. According to the OECD, public investment in space activities reached USD 75 billion in 2017, ranging from activities to support national security objectives to socio-economic developments, including in agriculture and energy. In 2019, the global space economy was valued at over $360 billion. Many industries rely heavily on space assets for their daily activities, and modern economy and globalization could not be what they are without satellite communications, which impact everything from the banking sector, aviation, and global transportation, to fighting transnational and maritime crime.

For the environment, space assets are important in early warning systems, urban and rural planning as well as in climate change monitoring. In the future, asteroid mining could limit the use of earth-based rare elements (though it remains uncertain how this will become economically viable or impact space debris).

In the domain of science and human potential, space supports strategic and high-technology industries, R&D as well as military planning and operations. Space activities reinforce private and public cooperation, as demonstrated by the example of SpaceX's manned NASA flight, launched in May 2020. Other commercial entities are developing similar capabilities, and they will assist NASA in deep space launches, travel and possible space colonization.

In the military and security domain, space assets provide critical support to air, sea and land force operations, especially by facilitating navigation and observation. Other endeavors include the militarization of space itself, the development of anti-satellite and other counter-space capabilities.

International diplomacy is impacted by space in terms of national prestige and also more concretely through information-gathering for international treaty compliance.

The strategic role of space for all seven state capacities justifies devoting financial and military resources for its protection and development. Such resources, however, should not be used to increase existing tensions and undermine the safe use of outer space as a Global Commons.

Space Forces: History & Capabilities

The media coverage around the US Space Force makes it recognizably better known today, but several other countries have either launched or revamped their space capabilities in recent years. An overview of these space forces – and similar institutional structures –is relevant in order to understand the wider geopolitical landscape of competition.

The United States Space Force was developed with the mission to "organize, train, and equip military space forces of the United States to provide: freedom of operation in, from, and to the space domain; and prompt and sustained space operations". It received a budget transfer of over $15 billion for the FY 2021 from the U.S. Air Force, which includes, among others, space-related weapons systems and operations, as well as education and training, and civilian personnel costs. It has significant kinetic physical capabilities notably ASAT, tested during the Cold War and more recently in 2008.

The Russian space force is older and used to be part of the aerospace force created in 1992. The creation of the US space force has prompted Russia to invest more in these capabilities, as the new US space force is seen as a threat . Russia's capabilities include kinetic physical capabilities such as

co-orbital ASAT weapons as well as kinetic physical weapons, and significant electronic and cyber capabilities.

China launched its aerospace force in 2014 and has continued developing its capabilities, to the point that it is able to conduct both kinetic and non-kinetic physical attacks as well as electronic and cyber-attacks. The Beidou navigation satellite launches illustrate the trend of increased autonomy, with an important final launch of the 55th satellite in the Beidou family in late June 2020, hailed as "entirely successful".

Plans for a United Kingdom Space Command gained momentum with the appointment of a new Director of Space (DOD) within the MOD in 2020. The incumbent guides the MOD's space policy, and will aim, among others, to develop high-energy lasers for anti-drone systems and missile defense.

France created its Space Command in 2019, with a budget set to increase by EUR 700 million by 2025. Its space policy, while generally defensive, underlines the importance of 'strategic autonomy', which includes plans for the potential weaponization of satellites, and the protection of assets against attacks.

In 2020, NATO released its Space Policy, following the Declaration of the 2018 Brussels Summit where space was recognized as a highly strategic and fast-evolving area of interest for the Alliance. NATO relies heavily on space assets for the conduct of operations and its space policy aims at fostering enhanced inter-operability between member states.

While cooperation may be more easily promoted within the transatlantic alliance, globally, it is rather a lack of transparency and mistrust that prevail, especially between major players such as the United States and China, but also – to some extent – between countries that have a tradition of cooperation such as France and Germany.

Two possible, contrasting, outcomes appear possible in theory: 1. space forces become amplifiers of threats to global peace and security, and 2. space forces become enablers of safety and cooperation in the space domain. The latter scenario can, however, only materialize with stronger bilateral and multilateral initiatives for collaboration. And, as it is often the case in global affairs, national interests dictate whether cooperation is ultimately preferable to confrontation.

Threats to International Peace & Security

With insights from neuroscience, I previously proposed a neuro-philosophical theory of human nature as emotional, amoral and egoistic. Drawing on the Realist analogy between human nature and state behavior, the same features apply to nation states. The emotionality of states deserves particular attention here. The emotionality of states debunks the fallacy of the premise that states are always rational actors. States are equally driven by emotional motivators, including by established strategic cultures, which are a product of historic and cultural idiosyncrasies. This emotionality (such as in the form of pride and prestige), impacts the space domain by creating uncertainty. The development of space forces increases the trend of nationalization, or unilateral pursuit of hegemony. (In 2018, then-VP, Mike Pence, stated that "it is not enough to have American presence in Space; we must have American dominance in space".)

Concomitantly, space is also increasingly weaponized through the development of ASAT capabilities and other kinetic and non-kinetic tools. An incident, even unintended, could have dramatic consequences and retaliation could endanger strategic assets both on Earth and in space. For example, in 2019, India conducted an ASAT capability test after Chinese and American tests, in 2007 and 2008,

respectively, which left a significant amount of space debris in Low Earth Orbit (LEO), threatening both other space assets and the environment.

Without generating debris, non-kinetic physical threats, which mostly rely on the use of lasers and nuclear power, are significant on their own. In 2019, Russia claimed to have developed a new ground-based laser weapon system, Peresvet, which could target space assets. Other threats come from electronic types of attack, in the form of jamming and spoofing of satellites. Jamming happens by interfering with a satellite signal, while spoofing recreates a false signal to confuse the receiver and potentially transfer false data. Such attacks are not uncommon: for instance, in 2019, Iran was accused of spoofing US ships in the Gulf of Oman, and in 2017 Russia was accused of spoofing the GPS system of ships in the Black Sea.

Finally, cyber threats have been on the rise in space. In 2014, for example, the US National Oceanic and Atmospheric Administration (NOAA)'s network was allegedly hacked by China, disturbing weather information systems, and compromising several entities worldwide.

Against the backdrop of geopolitical competition, the outer space domain is rendered ever more complex by the fact that it is also increasingly privatized. Hostile acts are, as a result, in the detriment of multilateralism but they also slow progress on other critical aspects of governance that affect private actors, such as space traffic management.

As terrestrial politics and tensions can be easily transferred to the space domain, the development of space forces can reinforce this trend by diverting more resources to the conduct of kinetic, electronic and cyber-attacks. Mitigation is crucial going forward.

Sustainable Space Security: the way forward

In the 21st century, security can no longer be understood as a zero-sum but rather as a multi-sum game where mutual and sustainable global security is the best option for all actors. While the international system remains anarchic (in the sense of an absence of overarching authority), strong interdependencies must push states to act in the logic of what I previously conceptualized as symbiotic realism, whereby the high stakes of space security makes cooperation in the interest of all actors.

The current international environment is, of course, not devoid of rules but it must evolve to reflect the many transformations in the space environment over the past five decades. For example, a frequently noted shortcoming in the 1967 Outer Space Treaty, which provides the international framework for international space law, is that it prohibits, among others, deploying weapons of mass destruction in outer space but it does not prohibit the launch of ballistic missiles through space. That is to say, the treaty does not prevent all forms of escalation, and it leaves many issues unaddressed, particularly in the age of new weapons and cyber technologies. Over the past decades, other initiatives, such as the Moon Agreement of 1979 (adopted by 11 states), or efforts led by Conference on Disarmament, notably the ad-hoc committee established in 1985 to consider a Proposed Prevention of an Arms Race in Space (PAROS) Treaty achieved little in advancing multilateralism in space.

Compliance with international law is more complicated in today's multipolar world. However, if multilateralism on the issue of arms control has been fractured, other mechanisms can help enhance trust and compliance in the long run.

This could take the form of increased technical cooperation over specialized matters, as well as continuing the decades-long collaboration within the ISS – or a new similar entity when ISS ceases

function. Furthermore, the development of new codes of conduct could lead to indirect regulation over issues such as debris, collision avoidance and weaponization. Another important measure is the creation of risk indicators and methodologies for guiding operations and gauging debris and cyber vulnerabilities. This goes hand-in-hand with auditing and oversight mechanisms, as well as more efficient reporting systems for private actors. Currently, the Convention on Registration of Objects Launched into Outer Space monitors space activities but that registration should be expanded to objects that are traditionally left unregistered such as military satellites.

These technical cooperation methods and new technologies cannot, however, independently make space safer for all. Ultimately, gaps in space law (such as over space mining and debris) must be addressed responsibly within international fora, and negotiations over legally binding agreements, including treaties that address the role of private actors, must remain a top priority for space actors.

If outer space becomes critically unsafe, it will not be selectively unsafe, but unsafe for all (in space and on earth). More energetic and collaborative efforts are paramount going forward before a critical tipping point is reached – an outcome with disastrous implications that no state can wish for, no matter how capable, ambitious, or competitive.

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