



The Role of International Cooperation for Stabilizing Potential Friction Points in the Space Domain

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Introduction

Current space activities are being carried out by a growing number and diversity of space actors who follow their own interests involving different, and sometimes conflicting, strategies and perceptions of policy and regulatory priorities. As terrestrial rivalries and competition move into the increasingly congested and operationally complex shared domain of space, the lack of a common vision opens the possibility for friction and conflict. This paper focuses on some of the potential friction points that we should be aware of and proposes measures to ensure that cooperation is effective in stabilizing the space domain.

Friction Points

Starting with the issue of uncoordinated “first mover” or “first come, first served” approaches to regulation, every year more satellites are being launched into a finite volume of space surrounding the Earth. Currently, there is no shared understanding of orbital carrying capacity. The advent of large satellite constellations, numbering in the tens of thousands, raises questions about the capacity of states to authorize and supervise such activities and how we implement internationally accepted principles of equitable access to orbit and spectrum resources. Those principles were articulated at a time when the pace of space activities was slow, and the orbital footprint of any given space activity was negligible in comparison to the extent of the domain. Generally, space actors could ignore the presence of other actors in their normal day-to-day operations. However, nowadays

the domain is much more crowded, with about 5,000 active satellites, and a foreseen order-of-magnitude increase in the number of active satellites over the coming years will require the development of a space traffic management framework, improved coordination among regulators, and some internationally agreed mechanism upon which states can manage and coordinate their utilization of shared orbit and spectrum resources.

Another manifestation of uncoordinated regulation may be found in different approaches to the governance of activities associated with the extraction and use of resources on celestial bodies. Different states are enacting legislation that is binding on entities under their jurisdiction and/or control but would not apply to entities from other states, potentially leading to friction. An example of a potential friction point here would be a unilateral declaration of safety zones or non-interference zones by an actor involved in space resource utilization activities on the Moon or other celestial bodies. Likewise, a unilateral declaration of keep-out zones or exclusion zones around space objects or distributed space systems might be seen as a form of territorialization of space that other actors would not accept.

Uncoordinated “first mover” or “first come, first served” approaches to regulation create the potential for friction as states may interpret such moves as de facto appropriation of an orbital region or a region on a celestial body, in violation of Article II of the Outer Space Treaty.

A second potential area for friction arises from the lack of norms for close-proximity operations of satellites, and here the matrix of possible interactions among civil, commercial, and military satellites grows increasingly complex with each passing year. In the case of military space actors, lack of transparency, mistrust, and misperceptions of behaviors might lead to miscalculations and actions that could heighten tensions on the ground or in space. For example, how would a nuclear-armed country respond if its early warning satellites experienced uncoordinated approaches by unknown objects? How would a commercial operator respond if faced with an uncoordinated co-orbital close approach by another space object? At a minimum, operators should strive to maintain a safe distance and trajectory and avoid harmful interference with other space objects. The [Tenets of Responsible Behavior in Space](#), announced by U.S. Defense Secretary Lloyd Austin in July 2021, is a unilateral commitment to certain behaviors that demonstrates U.S. leadership in norm setting. These kinds of initiatives should be broadly socialized to the point where they start to become behavioral norms.

A third potential friction point relates to the proliferation of counterspace capabilities. As more nations become critically reliant on space systems for their national security and defense, they are taking steps to safeguard such systems from disruption, denial, or destruction in times of heightened tension or conflict. Tests of kinetic antisatellite (ASAT) weapons in low Earth orbit (LEO) generate long-lived debris that poses a risk to many users of

space and threatens the continuity of vital space services. The lingering debris from the most recent ASAT test conducted by Russia in November 2021 will exacerbate the risks to spaceflight safety for a number of LEO satellite operators for several years to come. The world urgently needs to develop norms against the deliberate creation of debris through such tests in future. States should discuss this urgent issue in the relevant multilateral fora. One short-term option would be for the norm-building powers with ASAT capabilities to announce a voluntary moratorium on conducting further kinetic ASAT tests in LEO and to call on other countries to join them. This move would help to establish a norm that performing destructive ASAT tests in an increasingly congested LEO environment is irresponsible behavior that should be widely condemned and would serve to discourage other actors seeking to be viewed as responsible from performing such tests. A longer-term option would be to work towards a legally binding LEO kinetic ASAT test ban treaty.

A fourth potential friction point could arise from fragmented or divergent governance of space activities. In terms of international space law, states have a responsibility for the authorization and ongoing supervision of space activities conducted by entities under their jurisdiction. However, the pace and volume of space activities is straining the capacity of some states to exercise their regulatory functions. Moreover, the web of possible relationships among space actors has increased in complexity, and national regulators face challenges with chain-of-custody issues and phenomena such as regulation shopping. To avoid a fragmented governance system, with different standards of behavior in one common, shared domain, we will need to improve

cooperative governance of space activities.

A fifth potential friction point may arise as the great power rivalry between China and the United States extends to cis-lunar space. Although the volume of cis-lunar space is very large, the locations of greatest usefulness have limited carrying capacity. The few stable lunar orbits will attract more activity, potentially leading to congestion, collisions, and debris. This creates operational hazards in those orbits and on the lunar surface. The rush for “first mover” advantage to set precedents creates grounds for misperceptions and miscalculations, which are some of the elements of a classic security dilemma.

Looking further into the future, as humanity begins to venture into the solar system, distance will exacerbate the problems of fragmented governance. One potential area for friction could arise from fragmented, weak, or even non-existent governance in deep space or on other celestial bodies, where the private sector steps in to essentially provide some governmental functions, such as governance, regulation, enforcement, and defense. In another scenario, governments could deliberately devolve such powers to private sector entities operating in deep space or on other celestial bodies, far beyond the national territory. This situation could create the potential for friction among private sector actors or between government actors and private sector actors.

History provides a terrestrial example of such a scenario. The Dutch East India Company (DEIC), established in 1602, was the world’s first transnational megacorporation. It possessed quasi-governmental powers, including the ability to establish colonies, wage war, negotiate

treaties, imprison and execute convicts, and mint coins. Despite its many impressive achievements, the DEIC carried out aggressive colonialism and used violence and environmental destruction to protect its interests and maximize its profits, which caused great misery and suffering for thousands of people and contributed to the extinction of the dodo in Mauritius.

Cooperation as a Means of Reducing Friction Points: The Role of Multilateral Institutions

Having touched on some of the potential points of friction, what can be done to ensure that cooperation is effective in stabilizing the space domain? Many of the challenges to space sustainability and space security confronting us today are intrinsically multilateral in character. No single state or group of like-minded states or non-state actors can ensure the safety of their space operations and the stability of the space environment through their actions alone. The world can only achieve that goal through collective action, via common, shared values and goals—even if individual actors pursue their own independent (and possibly divergent) visions for space.

Multilateral institutions are vital to managing shared global problems. Key among these is the United Nations. Since the beginning of the space age, states have considered the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) the appropriate forum to discuss governance questions arising from outer space activities. Today, UN COPUOS has renewed importance because more and more countries are entering the space domain. The existing governance and regulatory regimes were

developed in an era when only a few states dominated space activities and the pace of development was gradual. Those regimes now require updating in line with the new era of space development to preserve outer space as a shared domain for the use and benefit of all nations. In this regard, multi-stakeholder dialogue on the ways and means of ensuring the secure and sustainable use of the Earth's orbital environment is of paramount importance. An encouraging indication that space is now regarded as a shared domain at the highest levels of multilateral diplomacy is the inclusion of space governance as a theme in the UN Secretary General's report *Our Common Agenda*, which addresses some of the key challenges facing humanity.

So, how do we best leverage multilateral institutions like the UN to promote cooperative solutions to avoid these friction points? First, an effective United Nations is the key to successful multilateralism. The post-WWII rules-based international order is currently facing its most severe test, so the international community should work towards a stronger, more networked, inclusive, and effective multilateral system that is able to adapt to global challenges while living up to the purposes and principles of the UN Charter. This requires strong leadership by norm-building powers.

Our Common Agenda envisages the UN convening a Summit of the Future, which will incorporate a space governance track that will bring together governments and other leading space actors in a broad multi-stakeholder dialogue to address, inter alia, the gaps in space governance. Partly, these gaps exist because there is at present no collective global vision for the

future of space activities, but rather a set of national, regional, and private sector programs. We also see state and non-state actors developing competing visions for space. This lack of a shared global vision hampers the discussions on how to address some of the challenges and friction points mentioned throughout this paper.

The Summit of the Future will provide an opportunity to shape the agenda of UN COPUOS for the coming decades. The Summit could seek high-level political agreement on the peaceful, secure, and sustainable use of outer space and agreement on a set of principles for the future governance of outer space activities that ensures the equitable and rational use of orbital resources. COPUOS is a forum of states, but the majority of active satellites in space are operated by commercial actors who are rapidly accumulating vast amounts of experience in all aspects of space operations. COPUOS should draw upon the expertise of civil society and private sector space actors to strengthen multilateral dialogue.

The discussions could address the development of an international regime to coordinate space traffic and the elaboration of transparency and confidence-building measures in outer space activities, such as information sharing, especially regarding close approaches between space objects; norms of behavior; and the development of new instruments to prevent the weaponization of outer space and to mitigate the risk of conflict in outer space. To not exacerbate the already serious debris situation, states should commit themselves to refrain from intentional creation of long-lived debris in outer space, including a commitment to refrain from carrying out debris-generating anti-satellite weapons tests in orbit.

A large fraction of current debates in

multilateral fora revolve around differences of opinion regarding whether the challenges to the safety, sustainability, and security of space activities are best addressed through voluntary or legally binding measures. Different state and non-state actors will inevitably have competing visions for space exploration. In the case of the billionaire investors in space, these visionaries have the resources to turn their dreams into reality. Indeed, we may well see several equally compelling competing visions implemented in parallel, with no clear indication of which one(s) might prevail in the long term—and from the perspective of hedging our bets for the future, this may not be a bad thing!

One could argue that space is big enough to accommodate these various competing visions, but they will inevitably intersect, whether in space or on the surface of a celestial body. Thus, the potential for friction points. The world needs a more fundamental discourse about whether states and non-state actors can all agree on a common set of guiding principles that will offer an overarching framework for space activities in the future, which we can then fill in with the appropriate structures of cooperative governance to avoid friction at the points of intersection, so that these competing visions can co-exist without conflict. The Summit of the Future provides an opportunity to begin such a discussion.

Conclusion

As a much broader swathe of humanity begins to move into space, we will take with us all the attributes—both good and bad—that make us human, including all of our diversity and differences, and we will have to learn to co-exist in space, as we do on Earth. To do so, we will have to

apply the tools for peaceful coexistence that we have developed—the tools of dialogue, diplomacy, and the rule of law—that will allow us to accommodate different visions for space through cooperation and competition, rather than through friction and conflict.