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DEFENDING AMERICA’S PLACE IN SPACE:
FUTURE THREATS AND RULES

Co-sponsored by the American Bar Association Standing Committee on Law and National Security and the Nonproliferation Policy Education Center

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DEFENDING AMERICA’S PLACE IN SPACE: FUTURE THREATS AND RULES

WORKSHOP REPORT

Introduction:

The American Bar Association Standing Committee on Law and National Security (SCOLNS) and the Nonproliferation Policy Education Center (NPEC) held a law and policy workshop, “Defending America’s Place in Space: Future Threats and Rules,” on Thursday, January 17, 2019. The workshop was an initial collaboration between SCOLNS and NPEC concerning national security legal and policy issues which are emerging as space becomes an increasingly contested political, military, and economic domain. It is the hope of SCOLNS and NPEC that this projection will ultimately lead to a “Tallinn Manual” for space and national security matters.

The workshop sought to address a series of questions regarding national security challenges in space:

- What might a war in space look like?
- What activities in space may constitute hostile acts which justify a military or other forceful response?
- What upgrades to existing legal understandings or new agreements might make conflict in space less likely?

The workshop was followed by a dinner event featuring presentations by leading experts in the space field. The workshop was comprised of experts from SCOLNS, NPEC, the Department of Defense, academia, the Department of Commerce, the Intelligence Community, and think tanks. The discussion was governed under Chatham House rules, and therefore ideas and group affiliations from the workshop were not attributed to specific individuals.
## Workshop Participants

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Session I: What Will War in Space Look Like?

THE MILITARIZATION OF SPACE?

The session speaker, a former U.S. intelligence community official, argued that the United States has adopted an overly militaristic approach to the space domain, and that Washington would be better served by adopting a less “bombastic” posture. Discussion of space as a war-fighting domain and U.S. “space dominance” alarms both policy makers and the general public of other nations.

The United States should adopt a less martial approach to space policy for practical reasons as well as political ones.

- The dual-use technologies prevalent in space will pose a significant challenge for arms control efforts and legal regimes, as well as for the implementation of law of armed conflict (LOAC) adherence in space.
- Despite rhetoric, Washington cannot be assured of space dominance, as our adversaries have been investing in defense platforms to counteract our capabilities.
- Many acts which occur in the space domain are difficult to verify, making it difficult to understand intentions and respond to provocations in a measured manner.

It is necessary to be prudent in space policy because counter-offensive actions against potential threats may take on a dangerous “preventive war” rationale. The speaker believed that policy leaders had not thought through how the United States would respond to potential incidents in space, creating a risk of escalation.

THE KEY QUESTIONS

The speaker concluded his remarks with a series of questions for the group:

- How feasible is it to attribute a hostile action against U.S. or allied spacecraft?
- How does Washington take counteroffensive action against threatening weaponry or activities in space without risking a major escalation?
Is it possible to respond to a space incident in a different domain in a way that is proportional, yet demonstrates the seriousness of the response?

The speaker’s presentation and questions engendered significant discussion and debate among the assembled experts. In response to a question regarding what a conflict in space may look like, the speaker stated that anything happening in space is ancillary to what is happening on the ground. For example, an adversary may try to interfere with our national command warning systems or disrupt our space-based tactical communication ability. In all likelihood a “war in space” will be an element on an already ongoing conflict. Future conflicts are increasingly likely to have a space component.

The speaker further argued that elements of war conducted in terrestrial spaces involve space. Consequently, from a legal perspective, systems used in space for warfighting become valid warfighting targets. We should anticipate war in space as one nation dismantling space services that an adversary nation is utilizing to conduct a terrestrial war and thereby become legitimate war targets. In that sense, “space attacks” may be inevitable, and consequently in every nation’s interest to plan for as a sovereign responsibility.

DEFINING A CONFLICT

One group member posed the question: when talking about war in space, how do policymakers define where and how conflict is occurring? There has been substantial discussion regarding military uses and warfighting in space, including about a potential “space force” armed service branch, yet space has been utilized to support a wide range of government and commercial activities for a long time. There are additional complications in space which require looking beyond assets and resources to support warfighting in the terrestrial domain. These complications are particularly relevant because many dual use space systems are so closely interconnected it is impossible to distinguish an object’s military and civilian applications.

Another member observed that the increasing use of space by commercial and civilian users creates additional risks in the context of an armed conflict in that domain. In the near future, for example, space mining competitors could utilize drones to capture a rival company’s
satellite. Multinational corporations are not as naturally inclined as nation state governments to preserve the status quo, increasing the risk of escalatory activity.

One member picked up on the tenor of earlier discussions to again emphasize that there is no “war” in space, just terrestrial war with a component that will occur in the space domain. In space, poorly constructed international agreements are worse than no agreement at all. That said, there are immensely important civilian objects in space. Six percent of Europe’s GDP, for example, depends upon satellites. Consequently, it is better to work to create norms and rules for possible space conflict now than to wait for a crisis to develop. Although the member agreed that there was no value in Washington adopting a “bombastic” approach to space policy, it is important to remember that part of that perceived aggressiveness stems from the fact that the United States is a fundamentally more open society than our potential adversaries, who do not, for example, publish their military doctrines.

Regarding the theme of space being an additional domain for armed conflict, one panelist made note of the technical and strategic challenges unique to the space environment. In space, for example, satellites are inherently vulnerable to attack and cannot be protected in to the degree of ground-based objects. Attribution in space is possible, but can take a long time.

There was a discussion of the problem of the potential denial of access to space through the proliferation of space debris, and the possibility that nations can find a greater common interest in the problem of prevention and remediation of space debris (e.g. the UN Space Debris Mitigation Guidelines).

There was also a discussion of the lack of precision with the terminology used in the UN Space Treaties, such as the definition of “space” and “astronaut”, and how this may be challenged by practices in the commercial sector.

For a country such as the United States, which relies heavily on satellites, such assets are constantly vulnerable and the time scales for formulating an appropriate response are correspondingly shorter.
GOALS OF THE WORKSHOP

- The primary goal of this workshop is to help inform the current and future Administrations on how to conceptualize the space and national security challenge by beginning to develop what future space and national security issues will look like.

There are two pillars to this program:

- What can be done to establish rules of the road to help reduce ambiguity in space?
- The developing of space situational awareness, aided by technical and policy enablers.

Underlying these pillars are a series of assumptions:

- Technology develops more quickly than law and policy, which frequently have to “catch up” to things which have already been developed.
- States have an inherent right to self-defense in space as they do in other domains, but the line between self-defense and preemptive action is thin in the space domain.
- Because we have yet to have an active conflict in space, policymakers do not know if and how a space incident may lead to conflict on a wider scale.
- Rapid advances in technology and the inherent unknowns associated with the space domain make it necessary to develop new rules and sweep away arcane and esoteric terminology.

The dual-use aspects of space technology continued to receive attention throughout the discussion. This aspect of the space domain, one member suggested, may strain traditional international alliances and norms of behavior. Dual-use technology may also pose challenges for applying the law of armed conflict (LOAC) to space. For example, is Additional Protocol 1, Article 52 of the Geneva Conventions (“General Protection of Civilian Objects”) military objective test sufficient in space, where there will always be inherent ambiguity of attribution and purpose?

*Dual-use technology may also pose challenges for applying the law of armed conflict to space.*
Regarding international agreements in space, one panelist stated that it is difficult to conceive of bilateral or multilateral agreements that do not include language regarding non-interference in national technical means, which may prove a useful jumping off point for international dialogue. Many treaties protect the non-interference principle, but these are almost always bilateral agreements between the United States and Russia – none include China as a party. One agreement that includes both Russia and China is the Outer Space Treaty (UN Treaties and Principles on Outer Space). Article 9 of that treaty [state parties “shall be guided by the principle of cooperation and mutual assistance … with due regard to the corresponding interests of all other States Parties to the Treaty”] may have utility for states to shape norms, particularly as it relates to whether a conflict in space rises to the level of LOAC application.

Another panelist commented that the United States must consider how it views its obligations concerning the protection of commercial enterprises in space. The Defense Department, for example, will protect associated U.S. and allied contractors, but not facilities, because the government pays such companies to take risks in certain areas. Should this model be extended to the space domain?

Several panelists again returned to what a war in space would look like in a LOAC context. One member suggested looking at U.S. military nomenclature to understand how the Defense Department considers a potential conflict in space. The Department’s Joint Planning Guidance, which outlines the various “phases of war,” would be a good place to start. Reducing ambiguity would be an appropriate best next step, in order to create an opportunity for greater transparency. Finally, it would make sense for Washington and its allies to develop a clear set of criteria for what would happen should an adversary attack US/allied equities in space, in order to draw clear lines of distinction.

One panel member concluded the discussion by stating that the United States may be initiating a space arms race of rhetoric and vocabulary. Conflict in space appears to be similar to, as well as an extension of, terrestrial LOAC rules.

- Challenges in space – such as what dual-use satellites are targetable, and how the principle of proportionality is applied– will concern the application of terrestrial conflict rules in a novel domain.
ROBOTIC THREATS

The session speaker argued that the most pressing national security issue in space concerns robotic threats to vital state and private satellite systems. The speaker provided four reasons to focus on this concern:

- The U.S. lead in space continues to diminish, and space robots will likely be an applicable technology by the early 2020s, providing only a few years in which to develop a strategy to address the threat they pose.

- These robotic threats could force the United States not to wage even some necessary military campaigns and, thereby, destroy our alliance system that our allies are counting on the United States to come to their rescue. Among possible space threats, space robots are most likely, at least during the early to late 2020s, to trigger a large-scale conflict (or space “Pearl Harbor”) at the opening of a space war.

- Although we are at the eleventh hour, we still cannot defend or deter against these threats.

- This workshop is in a position to make “game-changing” contributions in time to address these threats and bring them the attention they deserve.

The speaker stated that currently, an adversary may legitimately place robotic spacecraft arbitrarily close to our critical satellites. Yes, we can see them coming, but we cannot do anything to prevent these robotic attackers from stalking, or sidling up to, our critical satellites. Once they are already so close to our satellites and upon further command from our adversary, they can travel the last short distance to near-simultaneously disable an intolerable number of our satellites because we would not have enough warning time to setup our defense to protect our satellites. The speaker consequently recommended:

- The Department of Defense Law of War Manual be updated to include provisions that adversary satellites be kept at a safe distance from U.S. spacecraft (buffer zone zones, keep out zones or self-defense zones).
• An adversary which sends spacecraft into too many of our self-defense zones shall be considered an aggressor under the law of armed conflict and be determined to have committed a use of force under international law,

• Once our self-defense zones have been penetrated, we should have the right of self-defense, including passive defense, reversible offensive defense and, as a last resort, irreversible offensive defense, to protect our satellites even before an attack has actually occurred. The United States will need to use bodyguard space craft to protect at least the expensive, few-in-number, large legacy satellites that the United States will have to rely on at least during the 2020s.

The panel had a variety of reactions to the speaker’s proposals. One panelist, while disagreeing that hostile applications of robotics are the biggest national security space threat, agreed that a buffer zone around space assets may be necessary, and argued that states have an inherent right of self-defense within a certain zone around an asset. Another panel member adopted a different approach, noting that in an international law context, the laws of physics do not apply in space the same way they do on Earth, meaning that policymakers have to be cautious in thinking that we can translate earthly physics and rules to space. The group was urged to avoid the use of false narratives. The United States, for example, is not likely to bomb Russia over damage to one of its satellites caused by a robot that got too close.

Another panelist observed that the United States should not want to create norms which in turn unduly limits its activities in space. Although the idea of a “keep out zone” in space may be comforting, it would be difficult to square with the requirements of the Outer Space Treaty that space is free for exploration and not subject to national appropriation. Additionally, the use of a declared buffer zone around certain satellites creates a problem of verification. The United States, for example, likely does not want adversaries to know which satellites Washington deems sufficiently important to merit such protection.

A panel member with an operations and intelligence background stated that the great burden with the speaker’s proposal involves discerning the intent of a possible robot attack. It would be difficult to discern the intent behind a single robot in proximity to a sensitive satellite. Although the intent of a potential adversary might be more readily understood if 20 robots
were placed in close proximity to a corresponding number of sensitive satellites, another panel-
ist observed that countries are unlikely to follow such a course, as adversaries would want at-
tribution to be ambiguous at best in order to avoid a retaliation.

A potential legal obstacle to the speaker’s proposal was rooted in the lack of the phrase “hostile act” in any of the applicable outer space treaties (except for the Moon Treaty). Consequently, it would be hard to invoke an offensive use of force by an adversary’s robot in space when it is unclear in the first place whether there is a norm which has been violated. For a use of force to be illegal under international law, it must be sufficiently “grave” to warrant a corre-
sponding action in self-defense.

A panel member from academia suggested to the group that the whole idea of a keep out zone represents a distinctly American way of looking at the world, a cultural bias which is unlikely to be accepted by others. Letting go of such preconceptions, however, may allow poli-
cymakers to think creatively about the application of new legal norms in space.

ARE SAFETY ZONES AN ANSWER?

A somewhat contrasting approach was offered by a panel member who argued that keep out zones may be feasible as a matter of safety. Nations already assign “spaces” in space for satellites, including frequency and control over a particular geographic area, as a standard practice of deconfliction to avoid a satellite collision. Such safety zones may have secondary, but important, military benefits. If a last resort option becomes to protect our assets with a preemptive strike upon an adversary’s capabilities, then legal and policy advisors have not done their job to provide principals with additional options. Part of the process of deconfliction in-
volves registering space assets in accordance with U.S. treaty obligations, but Washington and most states fail to properly register a majority of their space assets. Although most failures to register are the result of bureaucratic breakdowns rather than deliberate policy, no country has ever used the registration process to promote greater transparency regarding its activities in space.

In response to the discussion generated by his comments, the session speaker offered several closing remarks. The speaker agreed that bombing Russia over damage to one or even several of our satellites is unnecessary, escalatory, and not a proportional response. Instead, the speaker suggested the use of bodyguard spacecraft to block off the enemy spacecraft from reaching our satellites. He did not find that a keep out zone or a self-defense zone is difficult to square with the no national appropriation provision in the Outer Space Treaty. The United States, he argued, should propose that the 1974 Convention on Registration of Objects
Launched into Outer Space be amended to automatically include the self-defense zone in the registration of the satellite to be launched or, retroactively, already launched into space. This amendment would make clear that such a zone is not “national appropriation by claim of sovereignty” prohibited by the Outer Space Treaty, but instead a rule in the space traffic management, just as the registration of space objects, for keeping satellites apart and safe.

As to not wanting adversaries to know which satellites Washington deems sufficiently important to merit such protection, the speaker argued that our adversaries already have very good ideas what satellites for, such as, early warning of missile launches and communications in a nuclear-disrupted environment are vulnerable and important to us. Further, he argued, even when our adversaries know where our important satellites are, they would still be safe because they would be protected by the proposed self-defense zones, counter threats not just attacks, and bodyguard spacecraft.

The speaker also argued that, precisely because of the difficulty of discerning the intent behind robots in proximity to our satellites, that self-defense zones are necessary. He recommended that the United States also declare in peacetime and well before the conflict that no more than a threshold number of an adversary’s satellites, whether hostile or friendly, can be inside our self-defense zones at any time. Then, once that threshold is exceeded, the United States can take defensive actions to protect its satellites. Thus, the United States can timely activate defense without the hopeless task of determining intent first.

Other than this proposal, the speaker said he had not found another alternative that can be ready in time by the early 2020s to deal with the robotic threats. Unless others can develop an alternative quickly, it is risky to write off the only proposal in hand.

The speaker argued whether or not robots are the greatest space national security threat is relatively unimportant, because we have to defend against robotic threats, even if it were merely the 9th greatest threat. The fact that space remains an offense-dominated strategic environment necessitates developing defensive or deterrence capabilities for every serious threat. Lt. Gen. Robert Ashley, Director of the Defense Intelligence Agency (DIA), who is the United States’ highest-ranking military intelligence officer, said on 26 June 2018 that the U.S. lead in space is diminishing and tomorrow’s skies will be filled with enemy robot satellites. On 16 January 2019, Air Force’s National Air and

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The fact that space remains an offense-dominated strategic environment necessitates developing defensive or deterrence capabilities for every serious threat.
Space Intelligence Center echoed DIA’s concerns that peaceful space servicing spacecraft have “inherent counterspace capabilities...to cause physical damage, steal parts, or grapple with a satellite.” We currently do not have a means to counter the robotic threats in space, and the time period in which to confront this issue provides a window of only a few years. Given that the robotic threats will become very real by the early 2020s, lawyers have an obligation to keep international law in this area current and updated, including what actions taken in space by other nations the U.S. should consider to be hostile steps warranting a range of different responses, from a warning to military action.
Section III: What Upgrades to Existing Legal Understandings or New Agreements Might Make These Actions Less Likely?

A NEW LEGAL FRAMEWORK

At the outset of the discussion, the panel moderator observed that lawyers cannot help draft and develop laws unless they are able to understand the underlying issues and facts, making this topic a great source of discussion. Law unfortunately tends to lag behind technology, so it is necessary for groups such as SCOLNS to speak about how the law applies to the facts of space.

The panel presenters were legal academics who are part of a group working on a manual that will articulate existing international law, including LOAC, applicable to military space operations. The presenters noted at the outset that since the beginning space technology has always had dual military and civilian components. Despite the military aspects of many space endeavors, Articles 1 and 3 of the Outer Space Treaty state that cooperative principles govern the law of space, declaring space for use by all nations and that activities in space be carried out in accordance with international law, including the United Nations Charter.

Rapid advances in technology are placing significant strain on the application of these principles in space. This is partly due to the fact that, by the design of Washington and Moscow, there is little in the Outer Space Treaty that addresses the use of weapons in space. With no new treaties enacted to regulate state conduct in space since the 1970’s, the current framework is limited to “a bit of policy, and hopes, prayers, and dreams.” States such as the United States have been consistently silent regarding the enforcement of norms in space, which has led to a multitude of rules not being applied.

ARE NORMS POSSIBLE?

The presenters cautioned that attempts to develop space norms by analogy to other domains were unlikely to prove successful based on the current, unique space legal framework. In the United States, for example, the Outer Space Treaty’s Article 6 requirement that nations are responsible for the actions of their nationals in space has led to concerns that military forces may be called upon to protect and enable U.S. nationals or companies as commercial activity in

With no new treaties enacted to regulate state conduct in space since the 1970’s, the current framework is limited to “a bit of policy, and hopes, prayers, and dreams.”

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this area increases. History has demonstrated that conflict invariably ensues when companies explore and find resources.

The presentation elicited a number of reactions from the group. One member argued that, despite attempts to form a Tallinn Manual-like framework to guide legal norms in space, international law is ultimately decided by state practice and *opinio juris*. There is a dearth of cases, and academic articles talk about state practice alone because there is nothing else to go on. The answer to creating norms in space may not lie in international law, as states are often hesitant to call out illegal behavior for fear of impeding their own freedom of action.

Another panel member asked the group what practical actions may be possible to extend the Outer Space Treaty to the expected capabilities and actions of states and private actors in the near future? Again, there was a general consensus that Washington would prefer to not confront such issues for fear of limiting itself in a national security context in space.

Another panelist identified the changing nature of the international order as a cause for the lack of legal development in the space domain. When the Outer Space Treaty entered into force in 1967, the two major space players (the United States and the Soviets) wanted to create a document for oversight and overflight rights and verification. As a result, national security issues dominated the space environment. With an increasing number of players in the space domain, unfettered freedom of action and secrecy is no longer in the interests of the United States or its allies. At a recent conference in Geneva, for example, Russian and Chinese delegations opined that neither the law of armed conflict (LOAC) nor Article 51 of the U.N. Charter applied in space. This is not a norm Washington would agree to, but it is too stuck in a national security mindset to consider a new approach to space.

The panelists also examined the absence of representatives from the commercial sector as part of the working group. Because the commercial sector may be the most likely mover of policy in the contemporary space domain, the panelists felt that private actors required greater representation in these discussions.
THE CLASSIFICATION ISSUE

Many panelists argued that, regardless of whether the working group was able to attract new, diverse membership from the space private sector, the “elephant in the room” remained that a substantial amount of activity in space remains classified. This problem has become sufficiently pronounced that the democratization of space cannot operate under the current paradigm any longer. As a result, it is incumbent upon lawyers and political leaders to figure out how to incentivize moving the discussion forward. Sustained political leadership on this issue is required to develop new ways of thinking about space. Traditional think tanks are not tackling the big issues in this area, due to a perception that such challenges are too political and complicated.

➤ What is needed is a new generation of leaders to become interested and involved in these matters, which hopefully will bring fresh perspectives.
Dinner Program

A PRIVATE SECTOR VIEW

The SCOLNS/NPEC dinner program featured two speakers: a representative from a non-profit aerospace organization, and a leader of a space-oriented scientific foundation.

The first speaker posed a question for the group:

➢ Are there any “red lines” – something so objectionable that we would feel compelled to act in response – in space that require contemplation or is such a notion inapplicable in the space domain?

The speaker argued that although there are a great number of speculative red lines for conduct in space, the most important red line is in the mind – a red line of misconception. Such red lines of misconception in a geopolitical crisis could either paralyze us or lead us to make really bad decisions.

THE CHALLENGES OF SPACE AND CURRENT TRENDS

The speaker explained that he wanted to talk about how the space domain is changing, and how certain legal and policy models may collapse as a result. The speaker challenged the audience to think about two heuristics:

- Space is an engineered domain in which humans do not naturally exist. Rather, we can only accomplish things when three elements come together: technological feasibility, economic viability, and policy permissiveness. All three factors constantly change in size and proportion. Rapid technological advancements, for example, have substantially altered economic liability models. Policy permissibility in space remains tricky for many reasons, not least of which is that our mental concepts for grappling with what is permissible in space for things like privacy and national security remain archaic.

- Our minds have an enormous challenge in coming to terms with change which is exponential in nature. Whereas most people are only able to think linearly, developments in space, such as private intelligence, have exponential potential.
Three big trends are currently occurring in space which shape what we can and cannot do in that domain.

- Humans are beginning to crowd space, which will force us to think fundamentally about how we organize the space domain.
- Space is also undergoing democratization, in which new actors, who often have different value sets than traditional space powers, are creating novel pressures.
- Regarding contested space issues, it is vitally important to develop norms of behavior and rules of the road so that we do not inadvertently cross red lines unnecessarily.

This will require a common intellectual framework. Red lines are hard to find, and even harder to find when core assumptions about the operating environment are being redefined.

**CHALLENGES TO REFORM**

The second speaker offered three main thoughts for the working group.

- Classification of space material stifling discussion
- The primacy of private sectors in space
- Overcoming space orthodoxy in planning and policymaking

First, discussions regarding the space domain are encumbered by an excessive amount of classification and secrecy. Today we are more secrecy prone than our economic, military, and cultural adversaries. It is necessary to figure out a way in which to discuss threats in space, including space conflict, in an open fashion. This will require a hard push to find way in which to discuss these issues without getting into “real secrets."

The speaker also observed that new directions in space are not being pursued by governments, but rather by the private sector. Consequently, we need to look at how we regulate commerce and relations beyond Earth’s orbit. Many topical space concepts, such as the President’s proposed Space Force, will not make sense until we have an idea of the true economic
value of large numbers of people living in space. In the realm of emerging technologies and corresponding legal and policy frameworks, we must be prepared to discover that many of our assertions were wrong.

Finally, the speaker cautioned that often the biggest challenges in reforming how we think about the space domain is overcoming the orthodoxy of our own people and institutions. This is a worrisome reality, particularly as it relates to space and national security. If we adopt an overly legalistic approach in the immediate future, we will lose ground to other nations, such as China, who will proceed with developments in space regardless of international legal prohibitions.

**SAFETY MAY BE A PATH FORWARD – NEXT STEPS**

Following the dinner presentations, discussion focused on how the working group might encourage commercial actors to become a part of this ongoing dialogue. It was recommended that an invitation to join include a declaration to develop concrete recommendations, rather than mere questions for consideration. It may be that the recommendations prove incorrect, or that the working group’s conclusions attract little attention, but the current lack of discourse in an environment characterized by legal inaction and secrecy is unhelpful. The idea of utilizing “safety” as a means of encouraging changes in space policy was also considered, as safety is a concern shared by all space actors. There are plenty of frameworks, from legislation to insurance regimes, that may be able to incentivize better behavior in space, but it will take substantial discussion and leadership to chart a path forward.

- The working group will develop concrete recommendations for space policy, reach out to other space actors in the private sector, and place safety in space first.

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*The biggest challenges in reforming how we think about the space domain is overcoming the orthodoxy of our own people and institutions.*