

**Testimony before the U.S.-China Economic and Security
Review Commission**

Hearing on “Rule by Law: China’s Increasingly Global Legal Reach”

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Executive Summary

As the last two U.S. Administrations have laid out in their National Defense Strategies, the United States and China are engaged in a long-term strategic competition across diplomatic, information, military, and economic dimensions. The United States needs to focus on this challenge across all those avenues of competition and take a long-term perspective. The United States also needs to decide how best to work with allies and partners to promote its vision of the future while also dealing with shared global threats. While not the only domain for that competition, outer space is an important part of delivering capabilities and benefits to the world that can help grapple with those shared threats and also provide opportunities for a new vision of what is possible in the future.

This testimony addresses the current governance framework for outer space and China's views on that framework and existing institutions. It focuses on how that framework enables or constrains China's space activities, how China is using that framework to advance its space activities, where China's interests and those of the United States align or differ, and provides policy recommendations for Congress to address these issues.

My oral and written testimony today reflects the aggregate knowledge and insights from across Secure World Foundation's staff. Our perspective on this matter is informed by two main bodies of evidence. The first is China's actions and statements in multilateral diplomatic space fora, primarily the United Nations Committee on the Peaceful Uses of Outer Space (COPOUS) and the Conference on Disarmament (CD). As a non-governmental organization, SWF has been an observer and participant at many of these discussions over the last decade, giving us first-hand perspective on how China views issues related to space law and norms. We also have had direct experience partnering with Chinese academic institutions and NGOs to organize workshops and discussions on topics ranging from space debris to space security to commercial space.

Based on this evidence, our conclusion is that China has not sought to wage the same "lawfare" against the existing international legal framework and institutions in the space domain as it has in other domains, such as maritime. We assess this is likely because China perceives the current framework and institutions to not be hostile to its interests, and because it is able to play an active role in shaping the current space law framework. While it is possible that China may choose to break from those legal principles and norms in the future, we do not see strong evidence to support that conclusion, and doing so would contradict the diplomatic positions China has established over the last few decades.

The existing framework of laws and norms in space constrains China's behavior to the same amount they do the United States: that is to say, to a very limited degree. This is because while there are long-standing international legal principles on space activities, there has not been much agreement on how to interpret or implement those principles over the last several decades. That lack of agreement in part stems from the unwillingness of major space powers, including the United States, to place more restraints on space activities, because they have prioritized freedom of action.

As a result, China is conducting or planning to conduct many of the same space activities as the United States across civil, commercial, and national security sectors. China and the United States share some of the same concerns on issues such as deconfliction of space activities and frameworks for how to extract and utilize space resources on the Moon and other celestial bodies.

There are areas where the United States and China are pushing different agendas, however, and this is mainly in the discussions on space security issues. China continues to push for a new legally binding treaty on space arms control, as it has since 2008. The United States, meanwhile, has opposed any new legally binding measures on space security since 1980, and has instead pushed for voluntary guidelines and norms of behavior.

While the specific draft treaty that China and Russia have been pushing has not gained significant traction among other States, there is a general shared concern among many States that a norms-alone approach is insufficient to resolve the many issues and concerns regarding space threats and the potential for conflict on Earth to extend into space. Twelve countries have now followed the United States' lead in pledging a voluntary moratorium on destructive anti-satellite testing, and a 2022 UN General Assembly resolution supporting the moratoriums gained overwhelming support. However, many countries feel that these moratoriums are only the first step and that legally-binding measures must follow, and there are other security concerns, including uncoordinated close approaches between satellites, that remain unaddressed.

Our main policy proposal is for the United States to continue recent efforts to lead in space governance discussions and help shape their development in a way that benefits U.S. national interests. Recent efforts, such as the Artemis Accords developed by the Trump Administration and the anti-satellite testing moratorium proposed by the Biden Administration, are positive steps in that direction that should continue to have bipartisan support.

However, in its efforts to compete with China, the United States should not actively try to exclude China from multilateral discussions on space governance. Doing so is only likely to encourage China to shift towards a more hostile stance towards the existing space law framework and institutions.

The United States should also take steps to directly engage with China on space issues with the following goals:

- Exchanging views on principles and interpretations of key areas of outer space law
- Developing a better understanding of each other's space sectors, including private sector space activities
- Creating mechanisms to deconflict space activities and minimize the risks of misperceptions and mistakes that could heighten tensions or spark armed conflict

The Current International Space Law Framework And Its Impact on China

The current framework of international space law draws primarily from a set of core international treaties that were negotiated and drafted by the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), a standing body of Member States of the United Nations that has considered the political, legal, and scientific aspects of space activities since the beginning of the space age. (See Appendix 1 for a list of treaties, dates of adoption, and number of ratifying states).

The Outer Space Treaty outlines the core set of principles, rights, and obligations for international space activities. Three main principles lie at the heart of the international framework for space activities: freedom of exploration and use of space, peaceful purposes, and state responsibility.

Outer space is free to be explored, and no nation or state can restrict another state's legitimate access to space. Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all states without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies. The activity of exploring and using outer space is the "province of all mankind."

The caveat to this freedom of exploration is that it shall be done for peaceful purposes. Since the treaty entered into force, there has always been a debate about the definition of peaceful purposes, with two main interpretations arising: one says that peaceful purposes means "non-military" in any regard; the other holds that peaceful merely means "non-aggressive." The latter interpretation has gradually gained broader acceptance and today many countries conduct military space activities for a variety of missions, including intelligence collection, communications, early warning, and navigation.

However, the Outer Space Treaty does place some explicit restrictions on certain types of military space activities. Article IV requires that states refrain from placing nuclear weapons or other weapons of mass destruction into Earth orbit or installing or stationing them on celestial bodies (including the Moon). It further requires that the Moon and other celestial bodies be used for exclusively peaceful purposes; forbidding the establishment of military bases, installations, or fortifications on celestial bodies, and also forbidding testing weapons and conducting military maneuvers on celestial bodies.

One area where outer space law differs from much of terrestrial law is on the topic of state responsibility. In the usual dealings between people and foreign governments, people are not the responsibility of their governments. This is not the case in outer space activities. Under Article VI of the Outer Space Treaty, states are directly responsible for all their national space activities, whether that activity is conducted by the government itself or by any of its citizens or companies, and whether launching domestically or possibly even when its nationals are conducting space activities abroad. States are also required to authorize and continually supervise their national space activities, including by their private entities.

The other three main treaties largely elaborate upon and refine provisions of the foundational Outer Space Treaty. The 1968 Astronaut Rescue and Return Agreement refines and expands on the protection given to astronauts, while the 1972 Liability Convention similarly expands the provisions for liability for damage incurred in the launching and operation of space objects. The Liability Convention establishes absolute

liability for physical damage suffered on the surface of the Earth, or to aircraft in flight, and establishes a fault-based liability regime for space objects in outer space. The 1975 Registration Convention makes mandatory both international registration and the establishment of national registries of space objects.

In addition to these space-specific treaties, much of the existing body of international law also applies to space through Article III of the Outer Space Treaty, which incorporates space law into the larger body of international law. Consequently, other sources of public international law, including the UN Charter and International Humanitarian Law (also known as the Law of Armed Conflict), also apply in outer space. The practices of states, along with general principles of law, are also valid and often applicable to space activities.

The fifth major space treaty, the Moon Agreement, is in force for those countries who have ratified it. It places additional restrictions and requirements on space activities on the Moon and creates a framework for oversight and supervision of those activities, including commercial space activities and extraction and use of resources. However, only a small number of states have ratified the Moon Agreement, and most of the states with the capability of lunar space exploration are not states parties.

There has not been any new formal international space law since the drafting of the Moon Agreement in 1979. There has been, however, significant discussion on how to interpret and implement the provisions and principles contained in the core space treaties. These include significant debates within COPUOS, United Nations General Assembly resolutions, and other non-binding mechanisms by which states communicate their perspective on the interpretation and implementation of international space law.

Over the last twenty years, the main efforts within COPUOS have been towards developing voluntary guidelines for space activities. In 2008, COPUOS endorsed a set of orbital debris mitigation guidelines, which were originally developed by several national space agencies through the Inter-Agency Debris Coordination Committee (IADC). While the guidelines are voluntary at the international level, a growing number of countries have put in place national policy and regulatory frameworks to implement them in national space activities.

In 2010, COPUOS began a formal process to develop a new set of voluntary guidelines for the long-term sustainability of space activities (LTS). In 2019, COPUOS reached consensus and adopted a preamble and set of 21 LTS guidelines that cover the policy and legal framework for space activities, safety of space operations, international cooperation capacity-building, and awareness, and scientific and technical research and development.¹ Like the debris mitigation guidelines, the LTS guidelines are voluntary at the international level, but a growing number of countries are reporting on how they are being implemented nationally.

Another UN-related body, the Conference on Disarmament (CD), is a major forum where security and arms control issues are discussed. Created in 1980 as a forum directly purposed on international disarmament negotiations, the CD and its predecessors were instrumental in drafting numerous arms control agreements, including the Treaty on the Non-Proliferation of Nuclear Weapons (1968), the

¹ See the SWF Fact Sheet on the LTS guidelines at https://swfound.org/media/206891/swf_un_copuos_lts_guidelines_fact_sheet_november-2019-1.pdf

Biological Weapons Convention (1972), the Chemical Weapons Convention (1993), and the Comprehensive Nuclear-Test-Ban Treaty (1996).

In 1985, the CD established an ad hoc committee to identify and examine issues related to the Prevention of an Arms Race in Outer Space (PAROS), due to strong concerns from many states about the weaponization of space.² The United States opposed giving the committee a negotiating mandate. The committee convened each year through 1994, with no further meetings occurring as a result of the objections made by the United States. Since 1994, the CD has co-mingled PAROS with the elimination of nuclear weapons, fissile material controls, and negative security guarantees, and struggled to reach consensus on an agenda of work due to objections from one or more countries on at least one of those topics.

The Republic of China (Taiwan) signed the Outer Space Treaty on January 27, 1967, the first day it was opened for signature. Subsequently, the People's Republic of China (PRC) became a successor state party to the Outer Space Treaty. China, like the United States, is a party to all four major space treaties and neither are parties to the 1979 Moon Agreement.

As a result, international space law restricts China's space activities to the same degree it restricts the space activities of the United States. Both enjoy the freedom of exploration and use of space for peaceful purposes, both have the same restrictions against the placement of weapons of mass destruction in space or on celestial bodies, both have the same prohibitions on military activities on the Moon or other celestial bodies, and both bear responsibility for their national space activities (both governmental and private sector).

There are many situations where China does generally abide by the obligations and prohibitions established by international space law, voluntary guidelines such as orbital debris mitigation, and the broader set of norms of international behavior for space. These include providing prior notifications to aircraft and ships of ballistic missile and space launches, disposing of satellites at the end of life, and registering its space objects with the United Nations.

There are no known instances where China has violated international space law, although determining a violation is difficult due to the broad nature of international space law principles and obligations, and the lack of international consensus on their interpretation and implementation. For example, China has recently had several large rocket stages that re-entered the Earth's atmosphere in an uncontrolled manner that violated international guidelines and norms for orbital debris mitigation and created significant risks to life and property. However, these voluntary guidelines are not legally binding on China or any other state and China is not the only country to violate them, although its recent transgressions are among the most serious. Furthermore, while the Outer Space Treaty and Liability Convention specify that China would be absolutely liable for any physical damages such a re-entering space object would cause to people or structures on the Earth, there has never been a liability case brought to court under these

² See "Proposed Prevention of an Arms Race in Space (PAROS) Treaty," *Nuclear Threat Initiative*, <https://www.nti.org/learn/treaties-and-regimes/proposed-prevention-arms-race-space-paros-treaty/>

treaties, and there remain significant ambiguity as to what constitutes negligence in determining liability for damage to other space objects.

Registration is another example of the difficulty of determining whether or not a state has violated international law. While states parties to the Registration Convention are required to maintain a national registry of space objects and provide basic orbital parameters and other identifying information to the United Nations on a regular and voluntary basis, there is a wide range of differences in compliance. An analysis of decades worth of data on states' filings under the Registration Convention reveals a wide disparity in timeliness and accuracy.³ The United States, for example, has not always registered its X-37B spacecraft with the United Nations. Similarly, neither of China's two reusable spaceplanes, including the one currently in orbit, have been registered with the UN. It is also common practice for states to register payloads and large rocket bodies but not any of the many thousands of small pieces of orbital debris that exist in Earth orbit.

Anti-satellite testing is a third example of the lack of definition on application of international space law. Article IX of the Outer Space Treaty requires states parties to avoid harmful contamination of outer space, and if a state party to the treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space would cause potentially harmful interference with activities of other states parties, it is required to undertake appropriate international consultations before proceeding. Many outside observers would conclude that the deliberate destruction of a space object that creates significant orbital debris would fall under such an activity. However, to date no country has taken the official position that deliberate destruction of satellites, including the more than 70 anti-satellite tests conducted in space since 1959, constitutes "harmful contamination of outer space" or that giving or requesting prior consultations of such activities is required under the law.⁴

Much of this ambiguity on the application and enforcement of international space law stems from the reluctance of many states to further clarify the space governance framework. In particular, the United States has taken an approach to international space law since the 1980s that maximizes freedom of action in space, particularly for national security space activities. This approach includes arguing against setting a hard delimitation between the air and space regimes;⁵ creating exceptions for the testing of nuclear-armed ballistic missiles, hypersonic glide vehicles, and fractional orbital bombardment systems that

³ See the dataset of national space registries compiled and maintained by the University of Texas:: <https://doi.org/10.18738/T8/NBWWWZ>

⁴ A history of anti-satellite tests in space, the debris they created, and debris still on orbit can be found here: https://docs.google.com/spreadsheets/d/1e5GtZEzdo6xk41i2_ei3c8jRZDjvP4Xwz3BVsUHwi48/edit#gid=0

⁵ For example, see the United States statement on the agenda item on "Definition and Delimitation of Outer Space" given at the COPUOS Legal Subcommittee in on March 21, 2023, https://www.unoosa.org/documents/pdf/copuos/lsc/2023/Statements/21_PM/06a_USA_21_March_PM.pdf

traverse space;⁶ and arguing that the deliberate destruction of space objects does not require international consultations under Article IX of the Outer Space Treaty.⁷

China's Advancement of Space Activities and Approach to Commercial Space

China's space program dates back to 1958, with an initial early focus on ballistic missile and space launch technologies as well as satellite development. Since the 1990s, China has expanded its space activities and given them new emphasis for their role in demonstrating China's growing technological capacity and prestige as an emerging space power. This expansion includes human spaceflight, robotic space exploration of the Moon and Mars, and a growing set of national security space capabilities. Since the mid-2010s, China's space program has become a central part of what the Chinese Communist Party calls the "China Dream."⁸ President Xi has set an explicit policy goal of making China a global leader in space technology by 2045, which includes a significant focus on space for economic benefits and growth.

China is leveraging the existing international space law framework to advance its economic and commercial objectives in space to the same degree as many other countries, including the United States. The principle of freedom of action and the current interpretation of peaceful uses as "non-aggressive" has enabled China to develop and operate many of the same types of space capabilities as the United States, albeit not quite to the same degree of qualitative excellence.

For example, China operates its own global satellite navigation systems, BeiDou or "Compass", that looks and operates in a similar fashion to the U.S. Global Positioning System (GPS), although with some technical and operational differences. While the United States and China have agreed to broadcast compatible civil signals from GPS and BeiDou (along with several other global and regional GNSS systems), they also operate different military navigation signals. China has a significant and growing number of satellites for intelligence, surveillance, and reconnaissance (ISR) that give it significant global coverage and temporal resolution,⁹ but individually China's ISR satellites are not of the same quality as the most advanced ISR satellites operated by the National Reconnaissance Office and other U.S. government and commercial entities.

In our experience, we see China as having similar concerns about the uncertainty of the space law framework for its planned future space activities as we see in the United States. For example, Chinese experts participating in the Global Expert Group on Sustainable Lunar Activities (GEGSLA), a discussion

⁶ See DOD Law of War Manual, section 14.10.3.1, that states, "the Outer Space Treaty does not ban the use of nuclear or other weapons of mass destruction that go into a fractional orbit or engage in suborbital flight" <https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf>

⁷ See transcript from DoD News Briefing with Deputy National Security Advisor Jeffrey, Gen. Cartwright and NASA Administrator Griffin, February 14, 2008, pg 52, <https://airandspace.law.olemiss.edu/pdfs/usa193-selected-documents.pdf>

⁸ Kevin Pollpeter, Timothy Ditter, Anthony Miller, and Brian Waidelich, "China's Space Narrative," *China Aerospace Studies Institute*, October 2020, <https://airuniversity.af.edu/Portals/10/CASI/Conference-2020/CASI%20Conference%20China%20Space%20Narrative.pdf>

⁹ For a recent survey of this topic, see Henk H.F. Smid, "An analysis of Chinese remote sensing satellites," *The Space Review*, September 26, 2022, <https://www.thespacereview.com/article/4453/1>

body created by the international non-profit organization the Moon Village Association,¹⁰ expressed concerns about interoperability and environmental management for future lunar space activities. Chinese participants engaged positively and constructively in working towards consensus outcomes within GEGSLA, which in turn makes recommendations to bodies such as COPUOS for future areas of work.

China has reacted to the growth of the private space industry in the United States primarily by attempting to foster a similar industry within China. Chinese space scholars and industry figures have held up leading U.S. space companies as role models and have urged China to develop its own commercial space industry.¹¹ There is one area where China has been antagonistic to U.S. private sector space activities, and that is use of commercial space capabilities in an armed conflict. China has raised concerns within COPUOS about the role of SpaceX's Starlink constellation in providing military capabilities to Ukraine, and has specifically stated that such commercial satellites may become legitimate military targets.¹²

China's private space industry is a complicated subject to try and understand. In part, this is due to the challenges around defining what is meant by "commercial space".¹³ Additionally, within China there are multiple competing views on the proper role for the private sector, and also different efforts underway at the national and provincial levels. Many Chinese "commercial space companies" are owned or controlled by the state owned enterprises (SOEs) and serve more as vehicles to broaden the market or find other applications for technologies developed as part of government-funded programs.¹⁴ However, there are at least a few Chinese companies that largely fit the American definition of "commercial" and exist as private entities operating with private capital.

Despite these challenges, China has put increased focus on its own commercial space sector since 2014. However, this focus has so far yielded mixed results, in part due to pushback from some of the SOEs, China's own national security concerns, and challenges in accessing the global space market due to U.S. and allied export control restrictions.

China's Legal Approaches to Space and International Institutions

In general, China has played a constructive role in the discussion and debate about space governance, largely through its participation in COPUOS. For example, China was an active participant in the LTS effort with COPUOS, with experts serving in each of the Expert Groups that began the process and then

¹⁰ For more information about the GEGSLA, see <https://moonvillageassociation.org/gegsla/about/>

¹¹ Pollpeter et al, pg. 29

¹² See Working Paper Submitted by China to the Third Session of the UN Open-Ended Working Group on Reducing Space Threats Through Norms, Rules and Principles of Responsible Behaviours, [https://docs-library.unoda.org/Open-Ended_Working_Group_on_Reducing_Space_Threats_\(2022\)/202301~1.PDF](https://docs-library.unoda.org/Open-Ended_Working_Group_on_Reducing_Space_Threats_(2022)/202301~1.PDF)

¹³ Kathryn Walsh, Ian Christensen, and Rob Ronci, "Lost Without Translation: Identifying Gaps in U.S. Perceptions of the Chinese Commercial Space Sector," *Secure World Foundation and the Caelus Foundation*, February 2021, https://swfound.org/media/207116/swf_caelus_lost_without_translation_identifying_gaps_in_us_perceptions_of_the_chinese_commercial_space_sector_2021.pdf

¹⁴ For a more detailed analysis, see Irina Liu, Evan Linck, Bhavya Lal, Keith W. Crane, Xueying Han, Thomas J. Colvin, "Evaluation of CHINA's Commercial Space Sector," *Institute for Defense Analysis Scientific and Technical Policy Institute*, September 2019, <https://www.ida.org/-/media/feature/publications/e/ev/evaluation-of-chinas-commercial-space-sector/d-10873.ashx>

the subsequent political discussions. China's role in the process was in stark contrast to that of Russia. From 2014 until the end of the LTS effort, Russia sought to undermine, delay, and obstruct the LTS discussions in response to the U.S. and European sanctions following Russia's aggression in Crimea and Ukraine. Notably, China (along with Brazil) broke from Russia during a key moment in the LTS discussions when Russia tried to halt the entire effort. China reaffirmed its support for the LTS discussions and in doing so assured their continuation despite Russian objections.

In more recent discussions within COPUOS, China has participated constructively in discussions ranging from implementation of the LTS guidelines, transparency mechanisms for utilization of space resources, and coordination of lunar activities. China has not joined with or supported on-going Russian efforts to obstruct discussions within COPUOS.

One of the most critical areas of discussion and debate is on the legal framework for extraction and use of space resources, including on the Moon and other celestial bodies such as asteroids. This is a critical question in space law, as many future space activities hinge on whether or not space resources, including regolith, water, and other minerals or elements, can be utilized in-situ or can be used to generate significant economic value. While Article I of the Outer Space Treaty states that outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all states, Article II states that the outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

The United States has adopted the position that the current legal framework does not allow for states to claim territory on the Moon, but does allow for governments and private actors to extract and use any resources they find.¹⁵ This position also appears to have growing support from other countries, as it is part of the Artemis Accords which currently has 23 signatories.¹⁶ While some have argued that the Artemis Accords are in opposition to the Moon Agreement, two of the states parties to the Moon Agreement (Australia and Mexico) are also signatories to the Accords. Saudi Arabia withdrew from the Moon Agreement shortly after signing the Accords.

While China has not said so explicitly, it is our impression that China's interpretation of the existing international law on the extraction and utilization of space resources is similar to that of the United States and what is expressed in the Artemis Accords. China is planning on the same wide range of government and commercial lunar space activities as the United States, including those that involve the extraction and use of lunar ice and other resources, which necessitates a similar interpretation. However, in its official statements, China has emphasized equitable access and space as the province of all humankind and reinforced the need for an international coordinated framework for governance of space resource

¹⁵ See H.R.2262 - U.S. Commercial Space Launch and Competitiveness Act of 2015, <https://www.congress.gov/bill/114th-congress/house-bill/2262>; EO 13914, "Encouraging International Support for the Recovery and Use of Space Resources, April 6, 2020, <https://www.federalregister.gov/d/2020-07800>

¹⁶ <https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf>

utilization to avoid gaps or contradictions from domestic regimes.^{17,18,19} Thus, China has positioned itself firmly in the camp of most developing countries who are concerned about “rich” states being able to access space resources to the exclusion of less advanced states.

China’s expressed approach to international space law is different from that of the United States in one key aspect: its focus on legally-binding agreements and apparent disdain for purely “soft law” approaches such as norms of behavior. China has repeatedly expressed its view that many of the unanswered questions on space governance should be addressed through negotiation of legally-binding agreements, and not solely through creation of voluntary norms or guidelines. While China has expressed some support for norms, such as the LTS Guidelines, this support is generally tied to guidelines that implement existing international treaties and legal principles. For areas where there is no or unsettled international law, China has consistently called for new instruments to be created.

For example, China has consistently argued for the creation of new legally-binding agreements to address the weaponization of space and PAROS. In 2008, China and Russia presented a draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (PPWT) to the CD. The PPWT sought to define “space weapons” and to prohibit their deployment into outer space, but was silent on the development, testing, and deployment of ground-based anti-satellite weapons. Over the last fifteen years, China’s statements and contributions in space security discussions have been remarkably consistent in promoting the PPWT and linking it to the broad concerns of the international community over the weaponization of space.

Most outside experts assess the PPWT as an attempt to limit a potential future U.S. space-based missile defense program, which China and Russia believe would undermine their nuclear deterrent. While many countries within the UN have expressed similar concerns as China about PAROS, few have expressed outright support for the PPWT as it currently stands. The United States for its part has consistently dismissed the PPWT and characterized it as “a diplomatic ploy by the two nations to gain a military advantage.” However, until recently the United States has not offered any alternative proposals that address the issues and concerns raised by PAROS.

In December 2020, the United Kingdom led a coalition of countries (including the United States) as sponsors of UN General Assembly Resolution 75/36. The resolution, which passed resoundingly, called for national submissions to the UN Secretary General by May 2021 that would clarify how countries see threats to space security, identify responsible behavior in space, and suggest possible paths forward. The goal was to find commonalities that could break the impasse that for decades essentially had stopped

¹⁷ Statement of the G-77 and China during the Fifty-sixth session of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, 27 March - 7 April 2017, delivered by H.E. Ambassador Pilar Saborío de Rocafort, Permanent Representative of Costa Rica, <https://www.g77.org/vienna/OOSAAPR17.htm>.

¹⁸ G-77 and China statement during the Fifty-seventh session of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, from 9-20 April 2018, delivered by H.E. Ambassador H.E. Ms. Vivian N.R. OKEKE, Permanent Representative of Nigeria, <https://www.g77.org/vienna/OOSAAPR18.htm>.

¹⁹ G-77 and China Statement during the Fifty-eighth session of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, from 1-12 April 2019, delivered by H.E. Mr. Omar Amer Youssef, Ambassador, Permanent Representative of Egypt, <https://www.g77.org/vienna/OOSAAPR19.htm>.

progress in space security discussions in the Conference of Disarmament. Around 30 countries submitted responses, reflecting some convergence around the idea that the deliberate creation of space debris and the uncoordinated close approach to another country's satellite are irresponsible.²⁰ However, there was no agreement on how to address these issues.

In December 2021, UK officials, again with a strong coalition of co-sponsors, secured adoption of Resolution 76/231, which called for establishing an open-ended working group (OEWG) that would work on “reducing space threats through norms, rules and principles of responsible behaviour.” The OEWG on Space Threats (as it's commonly known) was tasked to meet twice each in 2022 and 2023 and given the mandate to examine the existing legal and normative framework regarding space threats arising from behavior, discuss threats to space systems and irresponsible actions, and recommend norms, rules, and principles of responsible behavior in space.

While the three meetings of the OEWG so far have had some challenges, mainly stemming from obstructionist behavior by Russia, the discussions have been a productive departure from the traditional PAROS deadlock. Multiple states are exchanging perspectives on what they see as the most pressing threats to space activities as well as potential ideas. This is likely due to the remit of the OEWG on Space Threats being different from the previous decades of debate on PAROS within the CD in two important aspects. One, it focuses on identifying and controlling behaviors in space, instead of focusing on objects and capabilities. Two, it includes both voluntary norms of behavior and legally binding rules and principles in the potential solution set, allowing participating countries to avoid the previous conundrum of having to choose between soft law and hard law approaches to space security.

For its part, the United States has abandoned its previous “just say no” strategy and has put forward a concrete proposal within the OEWG: it has asked countries to join with its recently declared moratorium on destructive anti-satellite testing in space that creates orbital debris. Twelve more countries have now done so, and many more countries have expressed support for the concept, as shown by the overwhelming vote by the UNGA (155 countries voting yes, nine voting no, and nine nations abstaining) in support of a resolution calling on states to commit to a moratorium on testing of destructive anti-satellite missiles.²¹

China has reacted mostly negatively to the ASAT testing moratorium concept. China welcomed any arms control initiative that contributed to PAROS but also expressed concern about the narrow scope of the testing moratoriums and suggested that they were a means of seeking advantage under the guise of arms control.²² China maintained that efforts to reduce space debris would be in vain if the weaponization of space were not prevented, and has continued to call for a legally binding space arms control agreement.

²⁰ UN Office for Disarmament Affairs (UNODA), “Report of the Secretary-General on Reducing Space Threats Through Norms, Rules and Principles of Responsible Behaviors (2021),” n.d., <https://www.un.org/disarmament/topics/outerspace-sg-report-outer-space-2021/>.

²¹ Theresa Hitchens, “US call for halting kinetic anti-satellite tests gets boost from UN vote,” *BreakingDefense*, December 9, 2022, <https://breakingdefense.com/2022/12/us-call-for-halting-kinetic-anti-satellite-tests-gets-boost-from-un-vote>

²² Jessica West, “The Open-Ended Working Group on Space Threats: Recap of the first meeting, May 2022,” *Project Ploughshares*, September 6, 2022, <https://www.ploughshares.ca/reports/the-open-ended-working-group-on-space-threats-recap-of-the-first-meeting-may-2022>

The discussions within the OEWG have also revealed one area where China's opinion on international space law differs dramatically from the United States. China (with support from Russia) has stated that International Humanitarian Law does not apply to space.²³ The substance of this position appears to be that China believes that international space law prohibits armed conflict in outer space, and thus acknowledging that IHL applies to space means permitting armed conflict to exist in outer space. To quote the Chinese representative to the OEWG, "support for IHL [in space] will result in the acknowledgement of space as a domain for war." It is unclear how much this position relies on deeply-held legal beliefs versus diplomatic positioning in reaction to recent U.S. policies publicly declaring space as a warfighting domain.

Overall, China has generally been supportive of the existing space law framework and institutions. We have not seen the same sorts of attacks on and undermining of the existing international legal framework and institutions for space that we have seen in other domains such as maritime. In our opinion, this is because China does not perceive the existing space law framework and institutions to be adversarial to China's ambitions and interests. This perception is likely based on a combination of China's long standing role in helping shape the international space legal framework and the lack of conflict between that framework and China's interests and activities in space.

Our assessment is that this support may change if China sees the existing space law framework or institutions evolve to become hostile to its interests, or if there are efforts to exclude China from participating in space governance discussions. In particular, we see the development and promotion of the Artemis Accords as a potential area that could create competing legal frameworks. Although we feel China likely agrees with the legal interpretations contained within the Accords, as explained earlier, China has not expressed public support for the Accords or its principles. Some Chinese experts have expressed concern about the Accords being developed outside of the UN framework.²⁴ We believe China's lack of support for the Accords is because China was excluded from the negotiations that led to the Accords and they, and the broader Artemis Program they support, have been pitched publicly as part of the U.S. competition with China.

China has recently announced a partnership with Russia in developing an International Lunar Research Station (ILRS). Although not explicitly described as an alternative to the Artemis Accords, the public branding of the ILRS and its documentation bears a strong resemblance to the Accords.²⁵ China and Russia have stated that the ILRS is open to international cooperation and participation by other countries, although none have yet to formally join. China and Russia have also announced that they will be developing a set of principles for the ILRS, but have not yet announced a timeframe for when the principles will be completed. It is an open question whether the ILRS principles will be similar to or different from those in the Artemis Accords, and the latter outcome could lead to a situation where there are competing frameworks for lunar space activities.

²³ Ibid.

²⁴ Guoyu Wang, "NASA's Artemis Accords: the path to a united space law or a divided one?" *The Space Review*, August 24, 2020, <https://www.thespacereview.com/article/4009/1>

²⁵"International Lunar Research Station (ILRS) Guide for Partnership," *Chinese National Space Agency*, June 2021, <http://www.cnsa.gov.cn/english/n6465652/n6465653/c6812150/content.html>

China's National Space Law Framework

While all states parties to the core space treaties share the same freedoms and obligations, they often differ significantly in how those principles are implemented nationally due to wide differences in national legal and political frameworks. China and the United States are no different in this regard, in that each has their own unique set of national institutions and legal frameworks, just like every other country that implements international law.

China, like many other countries, lacks a comprehensive and uniform national space legislation, but is putting in place various elements of a national policy and regulatory regime for space activities. China has enacted two administrative regulations addressing the issues of launching and registration of space objects: the 2001 *Measures for the Administration of Registration of Objects Launched into Outer Space* (Registration Measures) and the 2002 *Interim Measures on the Administration of Licensing the Project of Launching Civil Space* (Licensing Measures).²⁶ Additionally, China has also enacted the *Interim Instrument of Space Debris Mitigation and Management* (Space Debris Interim Instrument). The Registration and Licensing Measures have been enacted in the form of departmental regulations, which constitute one of the lowest levels of laws in China.

Over the past twelve years, China has issued a series of policy documents, the “white papers” on space activities, to complement the existing regulatory framework. The white papers are issued every five years by the Information Office of the State Council, and while they are not legally binding, they are significant because they reflect the growing size of Chinese space activities and the more active role played by China at the international level. The importance of the white papers is threefold: 1) they promote transparency over the nature of the Chinese space program and facilitate acceptance of China as a reliable partner for international projects; 2) they reinforce China's position of promoting the peaceful uses of outer space and respecting international obligations; and 3) they demonstrate that Chinese authorities are aware of the importance of giving a formal and consistent framework to the Chinese space program. Relatedly, Chinese authorities appear to be aware of the need for a structured national legal regime for space; as stated by the Secretary-General of the CNSA in 2014, national space law has been listed in the national legislation plan, and the CNSA is directly engaged in the process of working towards enacting the legislation.

It is unclear whether China's national legal and policy framework gives any significant advantages to its private space sector. China's private space sector is still tiny compared to that of the United States, which has by far the largest global share of both revenues and investment. China's space industry does enjoy significant political and financial support from both the federal and several provincial governments. China's commercial space sector may also benefit from China's civil-military integration policy. The massive state-owned enterprises (SOEs) that run China's government space programs have been encouraged to integrate private companies into military supply chains in an effort to boost innovation and reduce prices, and ensure better civil-military integration.²⁷ China has also included its space industry as

²⁶ https://www.unoosa.org/oosa/en/oosadoc/data/documents/2023/aac.105c.22023crp/aac.105c.22023crp.28_0.html

²⁷ Liu et al (2019), pp. 74

part of its Belt and Road Initiative (BRI) in an attempt to broaden the global market for its products and services. However, it is unclear how much success the space component of BRI is having at this point.

An example of these various initiatives at work can be seen in China's push for its Guo Wang constellation, which is its entry in the emerging low Earth orbit (LEO) satellite broadband market. China feels that it is far behind the leader in this sector, U.S.-based SpaceX and their Starlink constellation. Starlink currently operates more than 3,800 satellites in orbit providing broadband internet service in more than 32 countries. China has recently announced the creation of a new company called SatNet to develop and manage the Guo Wang constellation. SatNet exists at the same administrative level as the primary state-owned telcos as well as the two primary SOE aerospace companies, which is evidence of China's identification of satellite networks as a strategic infrastructure area. But the success of Guo Wang depends on negotiating market access in every country where it wants to provide services.

China's Position on Mechanisms for Moderating Relations in Space

Because China is conducting or planning to conduct in the future many of the same space activities as the United States, there are several areas where both the United States and China share similar concerns about gaps in the existing space governance framework.

There are several areas where China has expressed concerns about shortcomings in the existing space governance framework. A significant one previously mentioned is coordination of future lunar space activities. At the end of this year's meeting of the COPUOS Scientific and Technical Subcommittee in February, China gave a statement indicating that it would be open to formal discussion of coordinating lunar space activities within COPUOS. The mechanism of this coordination is unclear at this time, but one potential model is the International Committee on Global Navigation Satellite Systems (ICG). The ICG was established in 2005 under the umbrella of the UN and serves as a standing body where States can share perspectives and voluntarily coordinate on matters of mutual interest related to civil satellite-based positioning, navigation, timing, and value-added services. The ICG is the forum where the United States, China, Russia, Europe, India, and other countries have developed an interoperable set of civil navigation signals that are planned to be broadcast by all the major satellite navigation constellations.

On security issues, as noted earlier China continues to express significant concern about the weaponization of space, including the deployment of space-based weapons. These concerns seem to stem from its long-standing concern about the potential for a U.S. space-based missile defense system to undermine China's nuclear deterrent. China has repeatedly called for a new legally binding instrument to control arms in outer space. China has continually opposed a strict focus only on voluntary norms – or what it has referred to as a “code of conduct” – as it is concerned that this approach will result in the domination of outer space by one state.²⁸

Another area where both the United States and China have an interest in developing guardrails is on close approaches between satellites. The formal term for these activities are rendezvous and proximity

²⁸ Jessica West, “The Open-Ended Working Group on Space Threats: Recap of the Second Meeting, September 2022,” *Project Ploughshares*, January 2023, https://uploads-ssl.webflow.com/6285a140011bc6d7812a34ea/63bef1b78655c6e6474c8b59_OEWGSecondSessionJan2022.pdf

operations (RPO) and they generally involve a satellite altering its trajectory to come close to another space object. RPO are not new to space: they have been around since the Gemini 8 mission in 1966 and used extensively for human spaceflight since then. Over the last 20 years, the technology for doing RPO between robotic spacecraft has improved significantly and is now being explored and demonstrated on orbit by commercial firms, civil government organizations, and militaries for a wide variety of applications. Chief among these are the emerging field of satellite servicing, which includes the capability to approach, grasp, manipulate, modify, repair, refuel, integrate, and build completely new platforms and spacecraft in orbit. Some of these RPO capabilities and technologies could also be used to support national security space activities such as surveillance, intelligence collection, and even co-orbital anti-satellite weapons.

Over the last several years, both the United States and China have increased their RPO activities in space for civil, commercial, and national security programs. China has conducted multiple RPO between its own satellites in LEO and geosynchronous orbit (GSO), and has a pair of satellites in GSO, SY-12 (01) and SY-12 (02), that appear to be conducting a similar situational awareness and intelligence collection mission as the four GSSAP satellites operated by the U.S. military in GSO. In January 2022, there was a close approach between one of the U.S. GSSAP satellites and the two Chinese SY-12 satellites. In early 2022, China also used its SJ-21 satellite to dock with and remove one of its dead BeiDou satellites from GSO to the disposal graveyard. While on its face this was positive for the space environment and conducted in accordance with existing international law, the lack of transparency and communication about the SJ-21 created concerns about its activities in orbit.

Several countries, including the United States and China, have expressed concerns about uncoordinated RPOs during discussions at the OEWG on Space Threats. However, to date, there have been no explicit agreement for how to deal with them, aside from calls to “maintain safe separation and trajectory” without specifying how to define those terms. One concept for how we might approach the issue can be found in the maritime domain, and specifically the Incidents at Sea Agreement (IncSea) reached between the United States and the Soviet Union in 1972.²⁹ IncSea was driven by concerns that more frequent and dangerous encounters between U.S. and Soviet ships and aircraft in international waters could lead to a mistake that increased the risks of accidental war. The IncSea Agreement contained specific norms for how to avoid collisions, provide clarity of intentions, and refrain from aggressive actions that could be misperceived. A similar agreement for space could provide important guardrails and confidence-building measures as both countries increase their national security presence in space.

Another area where China has expressed support for mechanisms for moderating relations in space relates to the use of space assets and data, specifically that of open geospatial and in-situ data. They are an active member of the Group on Earth Observations (GEO), an intergovernmental partnership that improves the availability, access and use of Earth observations for a sustainable planet. This organization seeks to better integrate observing systems and share data by connecting existing infrastructures using common standards. China has often contributed resources and served in various leadership positions. This engagement is similar to their involvement in the United Nations Group Committee of Experts on Global Geospatial Information Management (UN-GGIM). In both fora, China has worked with the United States

²⁹ Michael Listner, “A Bilateral Approach From Maritime Law to Prevent Incidents in Space,” *The Space Review*, February 16, 2009, <https://www.thespacereview.com/article/1309/1>

and others to improve global access to environmental and other data needed for sustainability, humanitarian, and other global activities.

Policy Recommendations for the United States

The United States is in the midst of a long-term strategic competition with China that encompasses economic, political, and national security challenges across all domains, including outer space. Yet while recognizing the reality of this competition, we must not lose sight of the incredibly devastating consequences that an armed conflict with China will have for both countries and the entire world. Thus, while the United States should pursue policies and strategies that give it an advantage in that competition, it should be wary of taking steps that increase the risk of the competition escalating into armed conflict.

Space activities represent a particularly complex and challenging area for the U.S.-China relationship. While both the United States and China have long been significant space actors, there is not a prior track record of cooperation or collaboration between them on space activities. This is largely due to the domestic fears within the United States over China's space program. China's space program was founded by Qian Xuesen, a Manhattan Project scientist who was persecuted and eventually emigrated to China and helped found their nuclear weapons and space programs. This is consistent with how the United States has viewed China's space program: with great suspicion and responses that often exaggerated the threat while simultaneously creating the exact circumstances they were trying to prevent.

The United States and China will be operating in the shared domain of space for the foreseeable future. While direct cooperation on space activities is unlikely given the broader political issues surrounding the U.S.-China relationship, there are still important areas where the two countries need to explore and develop mechanisms to enable each to undertake their national space activities while minimizing the chances of direct conflict.

To that end, we believe that the United States should take steps to directly engage with China on space issues with the following goals:

- Exchanging views on principles and interpretations of key areas of outer space law
- Developing a better understanding of each other's space sectors, including commercial space activities
- Creating mechanisms to deconflict space activities and minimize the risks of misperceptions and mistakes that could heighten tensions or spark armed conflict

Bilateral exchanges with China. The Obama administration started two sets of bilateral exchanges with China, one on space safety and one on security. Space was also included in recent iterations of the bilateral Economic and Security Dialogue. The Trump administration largely continued these dialogues, although they were halted due to the travel restrictions imposed by the COVID-19 pandemic. We believe the U.S. should resume these bilateral exchanges as soon as possible.

As part of this, Congress should consider revising the Wolf Amendment to allow the Executive Branch to conduct limited space engagement with China without prior permission from Congress. Congress should modify the Wolf Amendment to allow NASA to engage in space activities with China that support U.S.

national interests. Priority areas for engagement include basic space science and research, robotic space exploration, and increased data sharing on space weather and orbital debris. More substantive engagement with China, to include cooperation on human spaceflight, should remain an area where Congress is involved.

Increase understanding of the Chinese space sector. Congress should work with the Administration to fund and carry out studies that systematically document and understand the structure and nature of the Chinese space ecosystem, how the industry is structured, the true relationships between the central government, the state-owned enterprises, and the private companies, the role of the provincial governments, how private capital operates in the Chinese space sector and how all of this relates to the space program priorities of the Chinese Communist Party.

Include China in multilateral discussions on space law principles, including those contained in the Artemis Accords. We recommend that the United States include China in discussions on space law principles, as attempting at exclusion is likely to result in China developing its own alternative interpretations that create a more uncertain legal environment for U.S. companies and potentially becoming hostile to those institutions. While it is likely too late to get China to sign on to the Artemis Accords, the United States should engage with China through COPUOS to try and reach broad international agreement on topics such as extraction and use of space resources and safety and deconfliction of lunar space activities.

Find common ground on uncoordinated RPOs. The United States, Russia, and China should discuss definitions of agreed behavior for military activities in space, in particular the interactions between their military satellites in space, akin to the discussions that led to the Incidents at Sea Agreement during the Cold War. As in the case of maritime operations, clarifying norms of behavior for noncooperative rendezvous and proximity operations and, where possible, providing notifications of upcoming activities can help reduce the chances of misperceptions that could increase tensions or spark conflict. As part of these discussions, the main space powers need to share their perspectives on how the existing laws of armed conflict apply to military space activities.

Finally, the United States needs to be open to legally-binding agreements on space activities, in addition to voluntary norms. U.S. insistence on voluntary guidelines and norms as the only approach to dealing with space governance challenges has limited international support for its proposals. Many countries have expressed their desire for rules-based approaches to dealing with space sustainability and security challenges in addition to voluntary norms. Part of the success of the anti-satellite test moratorium effort led by the United States is that it acknowledges that the moratoriums may eventually lead to a legally-binding instrument, assuaging concerns of countries who ultimately prefer the latter. In the end, the United States must decide whether the trade-off of limiting the possibility of some actions in the future is worth the benefits to space security and stability that the agreements bring now. Given how much the United States depends on space for enabling national security and furthering its economic development, proposing legally-binding instruments that are equitable, verifiable, and in the interest of the United States are likely to boost international support for U.S. diplomatic proposals versus those pushed by China.

Appendix 1 – International Space Treaties

Treaty	Adoption by General Assembly	Entered into Force	Number of Ratifying States as of January 2023 ³⁰
Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty)	1966	1967	113
Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (Astronaut Agreement)	1967	1968	99
Convention on International Liability for Damage Caused by Space Objects (Liability Convention)	1971	1972	98
Convention on Registration of Objects Launched into Outer Space (Registration Convention)	1974	1976	75
Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement)	1979	1984	18 ³¹

³⁰ United Nations Committee on the Peaceful Uses of Outer Space, *Status of International Agreements Relating to Activities in Outer Space as at 1 January 2023*, A/AC.105/C.2/2023/CRP.3 (2023), available at https://www.unoosa.org/oosa/ooasadoc/data/documents/2023/aac.105c.22023crp/aac.105c.22023crp.3_0.html and see latest depository notifications at <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/status/index.html>

³¹ Saudi Arabia withdrew from the Moon Agreement on 5 January 2023, with withdraw taking effect as of 5 January 2024, <https://treaties.un.org/doc/Publication/CN/2023/CN.4.2023-Eng.pdf>