



US-China Engagement in Space

Speakers

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Transcript

Victoria Samson: [00:03] Good afternoon. Thank you all for joining us. My name is Victoria Samson. I am the Washington Office Director of the Secure World Foundation. The Secure World Foundation is a private operating foundation that focuses on the long-term sustainable use of outer space.

[00:14] We use a cooperative international global approach to promote norms of behavior, and methods that would ensure that space is usable and accessible to everyone over the long term. We have a great panel. I don't want to take up too much time. I did want to talk a little bit about why we wanted to have this issue of US-China engagement.

[00:32] Obviously, China is a major space power. According to the Union of Concerned Scientists Satellite Database, as of end of November of last year, China had 284 satellites. China is actively moving towards a commercial space program. They were in news stories this week about an attempted and ultimately unsuccessful commercial launch, but trust me, they are going to get there as well.

[00:55] The Chinese have a very active soft power outreach in terms of using space to make connections internationally. China is very involved in multilateral forward discussions on space security and stability. These are all reasons why the United States needs to figure out a way in which to engage with China on space issues. I know our relationship is uneasy on the ground as well as on space.

[01:23] Due to congressional legislation, White House and NASA are not allowed to devour that at all, participation with China on space issues. This does of course send a message. The point of this panel was to discuss all those other ways in which we do and can continue to engage with China in various issues. China is a major space power, is a force to be reckoned with.

[01:44] It behooves us to figure out how we can coordinate, cooperate and engage together in the space domain. We'll be having viewpoints on this issue from the US, we're going to first have a specialist talk about the Chinese perspective on space policy and cooperation. We're going to have a couple of government folks talk about it from their agencies' perspectives, US and China engagement.

[02:09] We'll have a commercial perspective looking at that. Finally, a wrap-up discussion from NGO, my colleague right there. With that, you should have all copy of their bios. I am not going to read anyone's bios and start with them.

[02:22] Lincoln Hines, you can take the floor.

Lincoln Hines: [02:25] Hello. Today, I will be discussing recent developments in China space program and opportunities for cooperation with the United States. My research, broadly speaking, focuses on Chinese status for prestige ambitions and examines how these ambitions shape Chinese space policy.

[02:42] It's from this perspective that I will speak about potential opportunities for the United States to engage China and cooperation in our space. China's space program, like that of other spacefaring powers, is driven by security, commercial, and status concerns. In the domain of security, China is pursuing a full array of counter-space weapons.

[03:04] It's integrating space-based assets into its military in an effort to achieve information dominance. China's space program is notoriously opaque and has close ties to People's Liberation Army with launches occurring on military bases, and even Chinese human spaceflight program falling under the People's Liberation Army's General Armaments Department.

[03:23] To many US policymakers, China's pursuit of space power represents a clear and present threat to US satellites and sensors, as evidenced by China's 2007 ASAT test. While security interests are an obvious and important motive, undergirding Chinese space policy, they do not explain some of Chinese most costly and ambitious initiatives in space.

[03:42] China now has the second-largest space program in the planet. China has achieved several milestones in space program, placing a human in outer space in 2003, most recently landing the Chang'e-4 on the dark side of the moon. China moreover has unveiled the core module of its plan to place this planned space station, with plans to launch in 2022.

[04:09] From the outside, China has changed space policies, sometimes viewed as part of a large grand strategic plan. It's important to recognize the role of domestic politics in nationalism in China. While lamenting our own domestic politics, we often have the tendency to view other states as unitary, intentional, and strategic.

[04:30] Like all countries, Chinese domestic politics are complicated. While it's often easy to dismiss the importance of public opinion in closed states, the Chinese Communist Party cares deeply about maintaining its hold on power. It maintains extensive apparatus for collecting and censoring public opinion.

[04:48] Chinese new social credit system and even the innovation of an app for users to study Xi Jinping's thought are just a few examples illustrating CCP's concerns over legitimacy. Chinese Communist Party, in part, legitimizes its rule by claiming to regain respect for China, lost in what nationalist narratives describes China's century of humiliation.

[05:09] This is what Xi Jinping refers to when discussing the so-called Great National Rejuvenation of the Chinese Nation. China advertises extensively to domestic audiences that it has the dressings of a great power. China has hosted the Olympic Games, built its own infrastructure bank, launched the One Belt One Road initiative, and now has an aircraft carrier, despite the limited strategic rationale of possessing one.

[05:35] Likewise, in space, China's most expensive projects are designed to attain the dressings of a great power. Placing humans in space, building its own space station, and landing on the moon. Chinese leaders, like in other states, recognize the political utility of outer space for promoting national indemnity.

[05:52] As such, Chinese leaders have a keen interest in attaining recognition from the international community that China is an equal and a space power. These facts are important to keep in mind when attempting to comprehend Chinese policy making, and in understanding potential opportunities for cooperative engagement in space.

[06:06] Chinese interest in attaining recognition of its status as a great power, providing a means by which the United States can engage China and shape its behavior. To Chinese leaders, the attainment of status of prestige is invaluable political resource. Recognition of China's status as an equal in world politics is an important priority for Chinese foreign policy.

[06:26] We can see this rhetorically with Chinese efforts to get the United States on board with its framework of the so-called new model of major country relations, or to adopt the language of "win-win" cooperation. One avenue by which to attain Chinese support for US priorities in outer space is to entice it with the political carrot of recognition.

[06:46] Engaging China bilaterally or multilaterally as an equal member of the international community, similar to the responsible stakeholder framework, provides an important source of external and informal recognition of Chinese status ambitions.

[06:59] Political engagement through the United Nations or bilaterally through cooperation with NASA provides an informal means of recognizing Chinese status aspirations as a space power. Bilateral cooperation, moreover, serves as an important confidence building measure for reducing misperceptions between the United States and China.

[07:16] For United States, it would also provide greater information about how Chinese space policy is actually made. Recognition, however, should not be given freely. After all, this is a political carrot for enticing cooperation. China should not be rewarded for bad behavior or violating norms in space. At the same time, however, China should also not be indiscriminately punished.

[07:35] Should China act responsibly, the United States should give it fair credit. Cooperation with China, however, must also be a tailor to adjust to political realities.

[07:43] While Chinese and now US leaders have stated their interest in placing humans on the moon, the idea of the two powers cooperating bilaterally in a manner akin to US Soviet cooperation during the Apollo-Soyuz program seems far-fetched in the context of today's bilateral relations, which is a shame.

[07:58] While important differences exist between China and United States, bilateral relations are considerably better than those between the Americans and the Soviets during the Cold War. The cost of not cooperating with China are significant. The question is this, is the current situation in space sustainable? In long term, it is unlikely to be sustainable.

[08:16] Should China continue to be excluded from cooperating with the United States in space, [inaudible] create its own order. In this case, I cannot help but think of the case of the Asian Infrastructure Investment Bank. The United States lobbied intensively against the creation of this bank, yet policymakers were shocked when the rest of the world did not follow suit.

[08:34] Consequently, the United States lost an important opportunity to shape this institution and its roles. More broadly, should the two powers not engage one another, the possibility of misperception or the creation of the security dilemma in outer space is quite possible.

[08:45] Owing to the dual use nature of space capabilities, the potential of a security dilemma emerging between the United States and rising China is intolerably high.

[08:54] Some of my points Chinese ambitions for status provide the United States important avenue by which to engage China. Although such engagement should not be unconditional, it must be tailored to today's political realities. The current situation is unsustainable. Thank you.

[09:08] [applause]

Victoria: [09:08] [inaudible] go down the line. Patrick [inaudible] .

Patrick Besha: [09:10] Yes, good afternoon. I want to talk a little bit about the history of NASA's cooperation with China. Generally speaking, our cooperation began very soon after China's Reform and Opening Up back in 1978. At that time, a delegation of experts from China visited NASA headquarters in May 1979 as part of the overall national science and technology delegation to Washington, DC.

[09:39] One of the participants at that time was Ye Shuhua, who was one of the first women to become an academician at Chinese Academy of Sciences. This initial meeting was followed by others, culminating expert meetings, starting in 1982 on the subject of space geodesy.

[09:57] In 1992, 10 years later, NASA and the Chinese Academy of Sciences, specifically the Shanghai Astronomical Observatory, signed the first contemporary formal agreement that

included satellite laser ranging, BOBI, and GNSS scientific techniques in that exchange. This agreement has been extended every three to five years. It's presently active.

[10:21] In 2010, both sides met in Shanghai, and were hosted by the academician Ye Shuhua, 30 years after her delegation first traveled to NASA. Space geodesy, the focus of this agreement, has been used by both countries to conduct laser ranging experiments, from earth-based observatories to the surface of the moon, including the retroreflectors left there by the Apollo astronauts.

[10:45] Various techniques are employed to understand how the earth is situated in space to improve GPS, our own orbiting satellite infrastructure, and deep space navigation, including missions to the moon and Mars. Other cooperation in the last 10 years has included scientific teams focused on earth science, space science. These were initiated in 2006 at the conclusion of then administrator Griffin's trip to China.

[11:09] They were restarted in 2008. They were primarily a means to exchange low-level and non-sensitive data related to space geodesy, as we mentioned, but also atmospheric measurements, seismic observations of earth, and lunar surface measurements in the space science. These groups met several times over the ensuing years.

[11:29] In 2010, former presidents Obama and Hu Jintao signed a joint statement instructing their respective space programs to conduct reciprocal visits to human spaceflight facilities. By the NASA administrator at the time, NASA was hosted by Chinese authorities at their human spaceflight facilities in Beijing, and at the Jiuquan Space Launch center in the Gobi Desert.

[11:48] Shortly thereafter, legislation was passed that barred further cooperation. Chinese officials never in turn visited US facilities. Throughout the last 30 years there had been major political issues that have affected cooperation. For example, after Tiananmen Square, the US and China significantly curtailed cooperation in many areas. Space was included.

[12:11] For example, legislation passed in 1990 and 1991 suspended the export of US satellites to China. In 1993, President Clinton issued a waiver that enabled several US firms to launch satellites on Chinese rockets. Of course, just three years later, US satellite exploded during a failed launch.

[12:30] The subsequent investigation and documented instances in technology transfer later formed the basis of the Cox Commission, and the report that the commission wrote. Legislation passed in 1999 cast a very long shadow on prospects for space cooperation. Again, in 2007, after the Chinese ASAT test, cooperation was again shut down.

[12:49] In 2010, after the passage of the legislation prohibiting virtually all bilateral discussions between NASA and China cooperation again slowed to a crawl. That legislation codified in appropriations law is currently enforced today.

[13:02] To summarize, low-level bilateral cooperation over the years has likely been mutually beneficial, in terms of scientific gains, including the spread of norms of free and open access to data. That's something that NASA champions.

[13:19] Though there are significant recurring political issues that have made cooperation a highly complex proposition, engagement is an issue we're likely going to wrestle with for decades to come. It's not likely to get any easier.

[13:30] Just as some of the major scientific benefits to cooperation may increase, such as improving our understanding of climate change and exploration, many of the core concerns, such as technology transfer and the militarization of space have only become more acute and concerning over time.

[13:46] As for what lies ahead, ultimately, NASA is a science and technology agency. We don't dictate international relations. We follow the mandates that are provided by the White House and Congress. On the topic of cooperation, they are currently very clear. Thank you.

[14:04] [applause]

Audrey Schaffer: [14:08] Good afternoon, everyone. My name is Audrey Schaffer, and I work in the Department of Defense. Thanks, Victoria, for inviting me to speak on the panel today. I'm pleased to join my fellow panelists for this topic.

[14:20] Now, before I dive into talking about engagement with China from a national security's perspective, I ought to provide a little bit of context. To say that the US-China security relationship is complicated would probably actually be a little bit of an understatement.

[14:36] I did just want to read a quote or two from our National Defense Strategy, which was written under Secretary Madison, has continued to be championed by Acting Secretary Shanahan. It provides the strategic guidance to our department. It's very clear.

[14:51] It says that long-term strategic competition with Russia and China are the principal priorities for the department, because of the magnitude of the threats that they pose to US security and prosperity today, and the potential for those threats to increase in the future. That's a pretty strong statement.

[15:09] In fact, I think it was his very first day as Acting Secretary, Mr. Shanahan was asked about, essentially, what are your top three priorities? His answer was China, China, China. In that context, with the context of that being our overall defense guidance, that's how we have to look at space.

[15:33] Frankly, we're not going to treat space any different than any of the other traditional war fighting domains, land, air, and sea, when it comes to thinking about our relationship with China. In space in particular, we have seen a number of troubling developments.

[15:47] There have been several great products that have come out of the intelligence community over the last couple of months that have highlighted, not just space in some cases across the board, but in space, highlighted things that really, we hadn't talked about a whole lot before.

[16:02] The three reports that I would point you toward, one, is the Director for National Intelligence, Worldwide Threat Assessment. He has a testimony every year to both chambers of Congress. Second, and I happen to have my glossy copy of it. This is a Defense Intelligence Agency report on challenges to security in space.

[16:20] The third is a NASIC, The National Air and Space Intelligence Center, report on space security as well. Some quotes, the DNI Worldwide Threat Assessment says that, "We assess that China and Russia are training and equipping their military Space Forces, and fielding new anti-satellite weapons to hold US and allied space services at risk."

[16:43] DIA basically says the same thing, "The People's Liberation Army sees counter space operations as a means to deter and counter possible US intervention during a regional military conflict."

[16:54] Although I don't want to get into the specifics of capabilities today, just a couple of highlights from the DIA report, which actually, is very consistent with the counter space report that the Secure World Foundation released last year. They talk about how China continues to develop jammers dedicated to targeting synthetic-aperture radars.

[17:12] Developing jammers to target SATCOM over a range of frequency bands. Likely pursuing laser weapons. They have operational ground-based ASAT, intended to target LEO, and probably intend to pursue additional ASAT weapons capable of destroying satellites up to GO. That's a pretty broad swath of activity when it comes to military space capabilities.

[17:37] Frankly, at their heart, a lot of them are directed at the United States, as you can read in these reports. Now that I've gotten you all on a very sour note here, I do want to try and raise back to talk about the prospects for engagement. What do we do about that? To that, want to just hearken back a little bit to the Cold War and the competition that we had with the Soviet Union at that time.

[18:05] Even then when the relationship was just as strained, if not more so, we did manage to work bilaterally and multilaterally with the Soviets to really create mechanisms that would help reduce the risks of conflict and enhance stability.

[18:22] In fact, actually a more positive chord, if you will, from the National Defense Strategy says that the most far-reaching objective of this defense strategy is to set the military relationship between the United States and China on a path of transparency and non-aggression. Yes, it's a far-reaching goal. It's a stretch goal if you will. That is the objective, one of the objectives in our strategy.

[18:47] I think if you think about that US-Soviet relationship, it's probably a helpful model. Now things weren't exactly the same because during the Cold War our primary focus was avoiding the threat of nuclear exchange. The agreements that were created were really crafted around that, but two things.

[19:04] One, either those agreements were flexible enough, broad enough or just the link between our space systems for nuclear warning and nuclear command and control was there, such that a lot of the agreements that cover nuclear risk reduction also were applicable to space or were just broad enough that over time we can adapt those agreements to cover some of the space stability matters.

[19:30] In fact, a lot of those agreements have actually stood the test of time. They're now agreements between the US and Russia, was between the US and the Soviet Union. I even see today that they provide that baseline for a confidence in relationship, even when we continue to have disagreements over security matters.

[19:50] The fact of the matter is we don't actually have a lot of that really basic foundation in the US-China relationship. As much as I know folks would like to talk about developing norms, for example rendezvous and proximity operations. That's what I would call a stretch goal because we don't even have the really, really basic stuff in place yet.

[20:17] I just wanted to provide maybe three examples of where we do have things in place with the Russians. I know they're going to sound probably really basic to an audience that's sophisticated like you all are, but frankly, if we don't crawl before we walk, we can't walk before we run. We really got to start with the basics.

[20:39] The first is just routine exchanges of information. Literally sitting across the table and sharing a document like our national space policy or like our national defense strategy, which in most cases, we in the United States, we publish these things online. That's not always true in the Chinese case.

[20:56] Even just having exchanges of basic information, I think, is a foundation on which you can start to build confidence and increase transparency. The second is launch verifications. The US and Russia provide bilateral launch verifications of space vehicle launches per the START I Treaty.

[21:16] These are also notifications that are effectively the same as the notifications we provide multilaterally under the Hague Code of Conduct against Ballistic Missile Proliferation, which by the way has, I don't actually have the number, but it's quite a number of countries that provide those notifications. You can imagine, again thinking about the nuclear context of how that started.

[21:35] You didn't want a nuclear exchange to be started over at test of a missile or something like that. We provided those notifications as a confidence building measure. That's a great example of one where China is not a signatory to the Hague Code of Conduct. It doesn't necessarily provide launch notifications.

[21:52] That would be something, I think, very basic because once a missile has been launched, a space vehicle has been launched, it's pretty easy to detect. The final example is secure and authenticated communications channels. An example I would point to there is the Nuclear Risk Reduction Center.

[22:09] We call it on our side, or known as, the NRRC, which is cool if you ever had the chance to tour the State Department or if you know somebody in the arms control area, they can show you around the NRRC. It's kind of like a diplomatic ops center. I think it's staffed 24/7 and it provides authenticated and secure communications channels between states, the US and Russia, but also the US and a variety of other countries.

[22:34] We use it to provide everything from routine reports on numbers of weapons, missiles etc., to notifications of things like exercises or tests and all the way up to actual crisis communications channels. It's a way that you know that the message came from the government you thought it was and you know it's an official communication from that government.

[22:57] During the last administration, the US and Russia agreed to use that mechanism for communication on cyber incidents of concern. I think that's just another interesting model to look at for just really basic crawl-type engagement on a secured front. The only point I'll make before turning it over to Mike is...I should say all the things I just raised were grounded in treaties for the most part.

[23:24] Now practically speaking, I just don't see the opportunity for a treaty like this between the US and China right now. I don't think that should be a limiting factor. All of the things that I mentioned could be done on a voluntary basis. That's, anyway, the right place to start when we're talking about building trust and increasing transparency in a relationship. Thanks very much.

[23:52] [applause]

Mike Gold: [23:52] Let me first begin by thanking the Secure World Foundation. Secure World's never shy-away from the tough issues and I appreciate you tackling this one. My only caveat is I think it's well known my love of Chinese cuisine and missed opportunity for lunch folks. Couldn't you tell?

[24:17] [laughter]

Mike: [24:20] Also, before I begin my comments, let me be clear that I'm wearing my hat as chair of the Commercial Space Transportation Advisory Committee, which is the federal advisory committee to the FAA Office of Commercial Space Transportation. I like my job. Private school is expensive so Jeff and Marcia, I am not speaking in a corporate capacity today.

[24:40] We talk about China, and I think it's so different than the Soviet example. This isn't a conflict so much as it is a competition. No one was ever worried about those amazing Soviet

products driving US companies out of the market. We really need to think about this in a different, a new paradigm.

[25:07] Frankly, I think it's one that the US system is fundamentally ill suited to participate in because we don't have this kind of government control and direction for the economy like China does, and frankly many other nations are developing. It is a very serious issue, which is again why I'm glad we're getting some attention here.

[25:32] Going back to the COMSTAC and space transportation, we have seen China target industrial sectors, demand to dominate in those sectors and have been very successful in solar rays, etc. From my understanding space launch is next up and that China will want to reduce those expenses by five times what even Space X is offering.

[25:55] That's an existential threat to a critical capability to the US that I think we need to take seriously as an industry and as a company. Meantime in the satellite world, we're already seeing the competition develop from China. Previously the Chinese would, when they were doing a treaty or an agreement internationally weave-in a satellite sale to a country like Nigeria or a developing nation.

[26:22] They weren't really so much on the satellite scene in terms of big products with developed nations. Now we've seen satellite sales by China's Great Wall Corporation to TYCOM and to Indonesia, winning contracts that Europeans, Japanese, American entities otherwise could have.

[26:41] They're doing so with robust and substantial government support. Subsidies, even potential free launches, again these are the concerns that America can't compete or looking at subsidized or potentially free launches of satellites. Financing that allow the companies to not even pay anything until the satellite starts generating revenue.

[27:03] These are the kinds of forward-leaning economic incentives that I'm not seeing developed in the US, and that again could be a great threat to our company's health in the American industrial base. All of this in a backdrop where we can't even get the export-import bank going.

[27:26] I mean, I was so pleased to see the comments by Kudlow yesterday, two days ago that export-import is a national security tool, because it absolutely is. We're not in a conflict with China, but we're in a competition. Right now, to quote "The Untouchables," we're bringing a knife to a gunfight.

[27:46] We should be talking about what beyond export-import bank we can do to be competitive with China and, frankly, the rest of the world. Instead, we don't even have an export-import bank. Whether it's the satellite world or other activities in space, which always take a lot of financing, you're not going to get it done without at least this fundamental tool.

[28:10] My plead to all of us in the policy world and those associated with the administration and Congress, can we please at least give American industry a chance with export-import?

Again, relative to space transportation, COMSTAC, I think this is a critical issue for our health. I know you've all been waiting for me to talk about export control. Here is the moment.

[28:34] [laughter]

Mike: [28:34] I hope everyone had some coffee as we get into export control conversation. While I'm talking about the challenges, potential threat that China faces, I do want to caution everyone about overreacting. That's what we do here in Washington. See a threat, we go, "I know. I know," a skeptic, right? We never do that. Again, we talked about [inaudible] support.

[29:05] To be clear, absolutely justified by taking action against China to protect our technologies from China, and probably not doing nearly enough in that arena. What you don't want to do is throw the baby out with the bath water and start creating this amazing bureaucracy that makes it challenging, if not impossible, to US entities to work with NATO and major non-NATO allies.

[29:32] Guess what happens when you do that, and you take America out of the partnerships that you want to do with Europe, Japan, or Australia. Guess who fills that void. Everybody? Come on, audience.

[29:45] [laughter]

Group: [29:47] China.

Mike: [29:47] China, right? Let's all be cautious in our zeal to protect our technology and our edge from China that we're not doing things that are counterproductive relative to US competition with China. I think it was Norman Augustine who said, "If you protect your toothbrushes the same that you protect your diamonds, you're going to lose more diamonds than toothbrushes."

[30:14] The solution here is higher walls around a smaller area. We need to be probably more robust when it comes to China, but free up everything else so that we can compete effectively with Chinese overseas. When it comes to Export Control Reform, I would always describe it right now as driving with one foot on the acceleration and the other foot at the break.

[30:41] We've got a couple of NPRMs or ANPRMs, advanced notices of proposed rulemaking out on the street right now. One was for emerging technologies and tightening AI and other emerging tech in terms of export control the Department of Commerce is looking at, again driven by concerns about China. Totally justified, totally warranted.

[31:04] What we don't want to do is start throttling American AI so that you can't talk about AI to Britain or to Japan, and then we start to become less competitive actually helping China dominate the market. That's my fear there. We're looking to tighten with emerging technologies.

[31:25] Then on the other hand, we have the State of Commerce more recently put out advanced notices of proposed rulemaking in terms of how can we streamline the export control process? [laughs] How can we make it better?

[31:35] One comment might be let's be careful with your previous ANPRM relative to emerging technologies. It's almost a bit of a Jekyll and a Hyde going on right now relative to these issues. Again, export control reform and protection against China are not at odds with each other.

[31:54] These two things can travel together if we just pay a little bit of attention to nuance and make sure that we bolster US's competitiveness abroad while tightening on China. We can easily walk and chew gum at the same time with that.

[32:11] Saying a word on the Wolf Amendment real quick, as we talk about how we might engage with China. A lot of people think the Wolf Amendment is a prohibition on working with the Chinese. It's not. How many people have actually bothered to read the Wolf Amendment? Right? [laughs] What does it say?

[32:28] It says that you can work with China, but you need certification from the FBI, again totally warranted, and notification of Congress. Is that a prohibition? To me, those are two common sense steps right now. NASA can engage with China, has engaged with China under the auspices of the Wolf Amendment.

[32:50] I just want to try and puncture that myth a little bit that's out there that there's just absolute prohibition on doing anything with China, because it's not true. When it comes to the commercial sector, again, we can have commodity sales to China. I think number one is soybeans [laughs] that we sell to China.

[33:11] Also, airplanes, chicken feed, and also bandwidth, satellite community, again, pardon defense on industrial base that there's certain products that we can sell if it's available in the international market that helps with the trade deficit, and again, helps American companies to be competitive. We don't want to do anything to hurt that either.

[33:33] I'll just end with, like everyone else, I'm a "Star Trek" fan, so I believe in the future of going to space together, of all of us leaving our problems behind and creating a better world in space. That means interacting and bringing China with. While I believe in that better future, I think protection of human rights and a good faith relationship have to be a part of it as well and can't be ignored.

[34:04] With that I'll stop and look forward to Brian's comments.

[34:06] [applause]

Brian Weeden: [34:06] Thank you, everybody. I wanted to use my role and [inaudible] spot to highlight and connect a few things mentioned by the speakers. I'm going to bounce down a little bit here as I try and find a way to weave together some of the things that have been talked about.

[34:25] I want to emphasize, as Audrey mentioned, related to national defense strategy, for better, for worse, the US is engaged with China in a long-term strategic competition. That competition, as you've seen from this discussion, is happening across diplomatic information in military and economic sectors. That was part of our motivation in having the panel we have today.

[34:51] Is that you have people from the academic world, from civil space, from national security space, from industry and NGOs, all taking about this, because that's where the competition is. If the US is going to look at engagement with China, it's going to think across all of those different areas and not just focus on one or the other.

[35:13] I also thought it was useful that...I want to point out that none of us used the word race, which has been by some people to talk about this, "You know, we're now engaged in a new space race." That's such a facile description of the current situation that it probably does more harm than good.

[35:30] It talks about it in terms of a single event or a single capability or a single goal when it really is this much broader long-term competitions that we've been talking about. There's been recent articles by both Bleddyn Bowen in the "SpaceWatch.GLOBAL," and John Logsdon in "Aerospace America" talking about why it's not a race, why it is more complicated and a harder thing to get a handle on, that sort of a thing.

[35:55] Also, I want to point out, we deliberately chose the word engagement to title this, because of what that implies. It doesn't imply let's be best friends. It's about a set of interactions between two countries. That is exactly what we're looking for here is, what should the US's engagement strategy be with China across diplomatic information, economic, military sectors? How do all those bits and pieces fit together?

[36:27] Right now, at least in space, unfortunately, our only real engagement with China is in the national security world, and it happens to have the context of a military threat environment. Audrey mentioned the country supports. We have our own report that we're coming out with a new edition next week.

[36:47] In there we talk quite detailed about all of the stuff that Chinese and the Russians are doing, and the stuff that we're doing in space. For every example of something, let's say a rendezvous and prox ops that Russia or China are doing in space the US finds concerning or threatening, we can probably find one the US has done about the same time period that looks a whole lot like what they're doing.

[37:08] That is a concern, because all three of those countries value or increasingly value national security events at space. Those types of interactions without the level of transparency or communication, or even a basic level of trust and understanding, could go to a very bad place.

[37:27] The two big areas, one is rendezvous and proximity operations, RPOs, and the other is testing hit-to-kill technologies for anti-satellite weapons and ballistic missile defense. That's

something that's happening all the time. As we saw two days ago, in the case of India, stuff you do for hit-to-kill missile defense could easily be translated into hit-to-kill anti-satellite weapons. Those two go hand in hand.

[37:51] Part of our concern and my concern is that a future relationship with China that's built only on these mil-to-mil interactions in space, is more likely not to end up in a bad place, and by bad place I mean a direct military conflict.

[38:08] Pretty much everyone's saying, and including the highest levels of leadership in the DoD has said, "We don't want to end up in that place, that we don't want to end up in a conflict with China in space," because it could be a really bad situation for everyone including industry. A war zone is not a great place to have an investment in low-insurance...

[38:27] [crosstalk]

Brian: [38:27] A lot of military sales, but that's a temporary thing. [laughs] That's sort of what we're trying to get here is what can we do in the engagement to really meet that stated goal of reducing the chances that we end up in a hostile conflict in space or more broadly that could extend into space.

[38:50] Lincoln and Audrey both mentioned the Apollo-Soyuz, and in my talk a little bit about Soviet relations as well. We talk about the US-Soviet space relationship because that's the only example we have. Even though it's not really a great example, because the context around which today's US-China relationship is happening is so much different than it was back then.

[39:15] Today it's much more complicated. What engineers will call a multivariate problem, what diplomats probably call reality.

[39:22] [laughter]

Brian: [39:23] We have to think not just in this bipolar capitalism versus communism struggle for dominance, but across all these different sectors of activities, and there's more players. As we saw back to the India ASAT test, that was prompted in a large because of what China did 12 years ago, not really anything to do with the US directly. There's other players in the game that we have to think about in this relationship.

[39:52] It's not just thinking about the US and China. I want to touch on what Audrey mentioned a little bit about norms of behavior in space. Very much agree that there's some low-level stuff that needs to happen first. I don't think that means put off thinking about or even talking about the more difficult things, the mil-to-mil interactions, the norms around those, because it's already happened.

[40:20] As said, US and Chinese satellites are interacting with each other in space. We can't just hold off until we spend several years figuring out the lower-lever stuff. We've got to do it in the same pattern, the same time. We have been able to do this with other countries, others places and times.

[40:40] Back, as part of the Syria conflict, we set up a series of norms of behavior, rules of engagement with the Russians, that we were engaged in an active war zone with them on the other side, and we managed to have those discussions. I think we should probably manage to have those discussions with China, and we're not engaged in an active conflict.

[41:06] Talking more about what the engagement might look like. I wrote an article which the Stimson Center published several years ago. I was thinking through what engagement might look like. I'm going to recap a little bit here, but I'm happy to provide to anyone who wants more of the details. There's also a really good report done by CRS six or seven years ago outlining different categories of engagement.

[41:33] I cribbed some from there, but there's information and data sharing, there's space policy dialogue, and there's joined activities. Each of those three categories is useful in different areas. The information and data sharing is good to establish common operating picture and set of facts.

[41:52] The space policy dialogue, as Audrey mentioned, helps understand the views, concerns, and intentions, reduce miscommunication understanding, and the joined activities are there to achieve objectives that neither could achieve individually, or to develop experience in working together. All the stuff could be done top-down or it could be done bottom-up.

[42:13] The top-down is going to require a lot more buy-in and interest from top political leaders, which could be hard to do. Bottom-up can be easier to do, but probably not on the really big politically charged topics, [inaudible] required the top-down things.

[42:27] To quote a former professor of mine, "We should probably cooperate as part of the broader strategy of the engagement, not just cooperating for the sake of cooperating." A one-off approach is, "Hey, let's go do this cooperation in this area or this engagement in this area," probably unlikely to succeed or really have any real benefits outside of that little piece of it.

[42:51] US is going to have to put together a strategy on how it's going to engage with China in space and why across diplomatic, military, information and the economic industry. It's going to have to think about industry, it's got to think of the military, and everything else.

[43:10] I just want to close by touching on two things that Mike mentioned. One is the export controls piece. For a while it seemed like there was some sanity coming to that world. The recognition that the Cox Commission report and the whole space and ITAR push actually did far more harm to the American industry than it did to protecting it and rolling that back.

[43:37] Now there's seems to be beginnings of maybe a counterforce that is almost saying, "We need to put more in place." There's been some recent articles. It was the "The Wall Street Journal" talking about US commercial satellite companies and spectrum sales to companies being involved with China, and their pitching is some really sensitive military technology.

[44:02] It's a commodity, it's a commercial technology that is pretty freely available on the market. It's hard to see how that has a real deep connection to the military or to some sensitive technology. I'll point out that even the Trump administration, which has had some challenges with China, does want to encourage US companies to sell commodities and increase trade with China.

[44:28] There is that intention to be able to do that, because it's the American economy. To reiterate what Mike said, think about what technologies and capabilities truly are sensitive and protect, with the knowledge than in doing so, we're probably going to make it a little bit harder in those areas which are cut off data sharing and collaboration, and in everything else we should be competing.

[44:56] We should be competing with them for market share, compete with them for customers, because if we're not there, as we've seen, China probably is. Finally, let's talk just a minute on the Wolf Amendment. Absolutely agree, the Wolf Amendment is not prohibited, but the effect of it has been to prohibit.

[45:16] That's partly because any country or child, for those of you who are parents, who's told, "You have to come ask permission first," that has a deadening effect on. Nobody wants to ask for permission, particularly US Government with the executive branch sees itself as a separate actor, independent, and on equal status with Congress, that has a challenge.

[45:38] The rhetoric from at least the last decade or so for many of Congress on this has been extremely critical of any US agencies that have tried to do engagement. That combined with the affirmation has had the stifling effect. I probably reached too far to completely get rid of the Wolf Amendment, and as Mike said, there's probably real reasons to have some limits in place.

[46:05] It's probably time to think about how to relax or at least prescribe areas where we might want to think about having cooperation with China in space. That could lead to benefits for this whole engagement process. I'll stop there.

[46:19] [applause]

[46:19] [pause]

Victoria: [46:24] Thank you all. I think that our panelists gave us a lot to think about. I'd like to use the power of the chair just to point out, when we were talking about US-China engagement, there are definitely, as has been mentioned, complications and difficulties between our two countries. That does not mean we did not share common principles at a certain level in terms of what a responsible space actor does.

[46:54] I'm just highlighting that both of our countries are member of the IADC for the Debris Mitigation Guidelines that were agreed upon. Audrey, I'm sure, can speak a lot about her experience in the United Nations Committee on the Peaceful Uses of Outer Space, where last June the COPUOS wrapped eight years of discussions and came up with 21 guidelines that were agreed upon a consensus throughout the 84 member-nations.

[47:18] It is possible. We just need to figure out ways in which we can do it, again, in acting on our national interest, but making sure that we can find a way to make sure that space is used upon secure rights and sustainable over long term. With that, I can open up for questions from the audience if anyone has any. Teresa, please hold on, wait for the microphone, which is going to slowly make its way towards you.

[47:42] [laughter]

[47:42] [crosstalk]

Victoria: [47:42] This is being recorded, so we need the microphone to be able to capture your comments. Josh, to the rescue. If you wouldn't mind, please, when you have the microphone, say your name and affiliation place.

[47:58] [pause]

Teresa Hitchens: [48:02] Hi. I'm Teresa Hitchens with the Center for International and Security Studies at the University of Maryland until March 31st, [laughs] at which time, on April 1st, I will be starting a new position at Breaking Defense. Here today I am a scholar.

[48:17] [laughter]

Audience Member: [48:17] I want to thank the panel for their presentations, because they were all very good. I have a question, Audrey, for you, as you might expect. Under the Obama Administration, we started two sets of dialogues with China. One on civil space land, as I understand it, by the State Department, and one on military space dialogue at the Pentagon.

[48:42] Are those two sets of dialogues still ongoing, because it seems to me that they were a very first step in being able to establish some of these low-level discussions that we know that we need in order to build some kind of confidence in our relationship.

[49:03] We also very much still do that with the Russians, despite...I guess those are being curtailed now, too, but we have been doing with the Russians the same thing over a very long period of time.

Audrey: [49:16] Thanks, Teresa. Now, I'll actually have to talk about the civil dialogue? That's all right. I know it's ongoing, but I would probably say more about that. Just from a national security perspective, space is still part of our national security dialogues with China, but I haven't seen a lot of fruit come out of those dialogue in the last couple of years.

[49:41] I don't really have a great answer for you, Teresa, but yes, it's still on the agenda. Yes, it is still something that we want to talk about, but from my perspective there hasn't really been a meaningful engagement on space security in the last couple of years.

Male Panelist: [49:58] The civil space dialogue is led by the State Department, and surprisingly, I would pretty much agree [laughs], there is some more to what Audrey described. Ongoing, making progress, but probably not quickly or as significantly as you might want.

Victoria: [50:21] Thoughts of panel about what you recommend they would take up on these discussions, if you're able to give input on this.

Audrey: [50:31] I do, I give input, right?

[50:34] [off-mic comments]

Audrey: [50:34] OK, no, no. [laughs]

Male Panelist: [50:34] I think -- and Audrey can correct me if I'm wrong -- one of the regional impetuses for this was on the SSA data sharing front. Coming up with a better mechanism to share a little bit about SSA did, and more importantly close approach warnings with China. From what I hear, that has gone fairly well, and there's now a better process for that than in the past.

[51:08] Given that we're talking about what a country's doing in space and all these new military, commercial stuff and Mars constellations, I would think that would probably be an area that we could think about expanding or doing more on, because having that shared awareness of what's going on is probably a pretty big part of the transparency.

Male Panelist: [51:29] Respect for intellectual property would be nice. Also, we talk about the [inaudible] . I think there is, even if it's not explicit all the time, certainly implicit and helpful dialogue between us and China for many of the ideas, policies, and regulations that the US has been working on.

[51:52] I'm on the Hague International Space Resources Working Group. When it's come to asteroid mining and those kinds of policies, and I think even with the sustainability guidelines, China has played a relatively helpful role in that. Again, I would say I'd love for someone to have some conversation about IP with China.

[52:15] I'd love to have a conversation about unfair non-market forces in terms of international competition, but also recognizing that there has been constructive dialogue if not implicit cooperation on space policy [inaudible] .

Male Panelist: [52:32] I just want to add a couple of comments just to bring you back to the Chinese perspective. I'm trying to get across the idea that it's important to still think of China to recognize the complexity of the bureaucratic actors involved.

[52:49] When we talk about things like intellectual property, when you talk about who are we talking about? How much capacity does the government have to enforce its decisions? I think just even knowing what the landscape of who the appropriate actors are is an important even first step. I think that these ongoing dialogues would at least reveal that kind of information.

Victoria: [53:10] We had it, right there.

Lee: [53:12] Thank you, Mr. Chair. My name is Lee. I come from the Chinese Embassy Science Section. In the past 15 months, I attended a lot of [inaudible] type of events along this street.

Everybody talked about the elephant in the room, but it seems that all organizers were very reluctant to invite the elephant stay on the stage.

[53:37] [laughter]

Lee: [53:37] I have several observations. I attended several China-US Civilian Space Dialogue and such event. I was very familiar with the bilateral collaboration in the past or several decades. First observation is that I agree with Director Weeden that China has never liked to participate or forced to participate in any kind of race whether it's space race, arms race, or whatever race you'd find.

[54:05] However, I also realize that several of the panelists today used the word called dominate or domination. English is not my native language, so I'm not sure what exactly the word dominate means -- monopoly or monopolize or the similar meanings.

[54:25] What I would like to say is that, in the field of science and technology, from my experience or from the experience of history, no country could dominate in a specific area for a very long time. Actually, it's this word dominate is very poisonous, to some extent is unethical, I should say, because you just want to dominate and you just want to over compete everybody else here.

[54:52] What I would like to say is that we don't want to dominate in any area, whether it's AI, space, or robots. What I learned from all this strategy of our policy document is always say that China would like to keep parallel with other advanced countries or we'd like to join first-tier category of advanced countries by our efforts subsequently.

[55:14] What I learn from White House papers are holding papers from, say DoD, is that you yourself want to dominate. It's not China want to use the word dominate. That's what I'd like to clarify. About the Wolf Amendment or Wolf Clause here, Mr. Gold, don't you find some self-contradiction in your comments just now?

[55:38] You mentioned that the appalling bureaucracy about export controls seen in the United States, and you said that, seeing that Congress approval or FBI approval is prerequisite for NASA to initiate some dialog or exchange with Chinese side, in my opinion, this just add the administrative burden to the NASA or OSTP. It has nothing to do with us.

[56:01] We're OK, because every time we, NASA or OSTP, just ask us to provide some delicate list, it just adds their administrative burden, not ours. Actually, I wonder whether the Congress maybe not trust China, but I'm not sure whether the Congress also has confidence in all administrative agencies.

[56:25] They ask NASA or OSTP to report to them before they could contact us, which means that, in my understanding, they don't trust their administrative agencies, it's not Chinese side.

Victoria: [56:34] A couple of very interesting questions. Thank you. Hang on.

Male Panelist: [56:37] I'm a lawyer and a lobbyist, hypocrisy is my business.

[56:40] [laughter]

Lee: [56:42] I'm not a goddamn lawyer.

[56:44] [laughter]

Male Panelist: [56:44] It's one of us.

Lee: [56:47] Sorry. Just two more questions. The first one is that you mentioned the UN COPOUS. Just last year the Chinese side made a statement saying that in the future, the new Chinese space station will open to international collaboration with foreign countries.

[57:05] We welcome you to send some proposals with the Chinese about any future, potential, collaboration, whether it's manned spaceflight or the scientific experiment in the new Chinese space station in the future.

[57:18] The second issue is about the commerce space market. I just learned from my Chinese colleagues that the China National Space Agency say, we open our commercial launching business in China, not only to domestic, private enterprises but also to foreign companies. You can now provide launching service or the satellite in China, manufacturing whole owned foreign companies in China. There's no obstacle here.

[57:47] Last but not least, I would like to say a few words about visa issue. We know that later this year United States will host International Astronomical Congress, IAC, in the United States. In the past two decades, many Chinese delegations faced this dilemma that we could not get the visa from the state department.

[58:07] Actually, when you just say something, some words, to the visa officer, to the US Embassy in China, you will certainly face the, how to say, denial. It's very interesting, funny story I would like to share with you, because I don't think that any guy from State Department is here.

[58:21] One of my colleagues, his academic background in university is remote sensing. When the visa officer to the US Embassy in China asked what means for remote sensing. He explained very excitedly. This science background guy always like to explain what he learned or what he's doing.

[58:42] He said, "Remote sensing is used satellite or airplane, use visible obstacle instrument or the infrared, something, to see what happen on the earth." [inaudible] got denial very quickly.

[58:54] [laughter]

Lee: [58:57] These visa guys may not understand that remote sensing is not for espionage. It could be used for city planning, urban planning, for estimation of agricultural products, for other many use, civilian uses.

[59:10] I would like to say, I would like to see whether United States will continue to adopt this, I would like to say, ridiculous, visa policy to turn down all these Chinese scientists who would like to attend international events. Thank you very much.

Victoria: [59:27] Thank you, Mr. Lee. We'll ticket your car, and have you come back speak another time on the dais.

[59:33] [laughter]

Victoria: [59:33] A lot of stuff unpacked in there. We're going to start with Brian and go down the road.

Brian: [59:38] I'll take two of those. I'll take the dominance and the visa stuff. I agree with you that words do matter. I think there has been too careless use of words like dominance when it comes space policies or some recent activities.

[59:58] I whole-heartedly agree it's not, probably not possible to stay on top for very long or even to have such a major advantage that you're never going to be touched again, unless a perfect set of conditions happens, which may have happened after World War II for a little bit of time. That is very not ideal at all.

[60:19] The military, as all militaries do, sometimes talk about the word dominance in a more limited sense. Just the dominance over a certain battlefield or certain point, at a certain time, which I think is very appropriate.

[60:31] It's expanding that to talk about complete dominance over an entire domain, for an extended period, is probably as much of a unicorn as anything else that the hippies would want to put out there. I just had to say that you have to be careful about is the word leadership. Sometimes people use the word leadership when they really mean dominance. Leadership should be used in a different context.

[61:00] You talk about leadership of a quarterback on a football team or something along those lines, it's not about that person dominating or that individual dominating everybody else they work with. It's about them actually helping the group work better, together. I just want to make that point that we cover our language.

[61:19] On the visas thing, I agree with you, it is a huge challenge. Even we as an NGO, we often try to have workshops and discussions, and involve individuals from Russia and from China in those discussions. It's exceedingly difficult to do so if you're located here in the US.

[61:37] There has been times we've had to move stuff outside the US to be able to have a discussion that had any participation outside of the NATO countries and Japan. That really makes it difficult to have engagement that can address some of the challenges we've listened to today. I don't know anybody at visa office that can solve this, but I agree that it is a big concern.

Victoria: [62:02] Other thoughts.

Mike: [62:03] I would echo all of Brian's comments. Except as a Patriot's fan, Tom Brady does seek to dominate.

[62:09] [laughter]

Mike: [62:09] I think if there's any question there. I guess we'll take on the Wolf Amendment. Again, what I'm trying to point out with Wolf Amendment is I hear far too often it's just a probation. Frankly, as a lawyer, you see this all the time with policymakers, many even from our lawyers. They don't bother to read the actual rule. We just all operate on perception, innuendo, and that this is a prohibition.

[62:36] What I was trying to do with my comments is point out it indeed is not, and that there is the possibility of working with China productively on science with NASA. I'd have to go back, but I think it's even been done under the auspices of the Wolf Amendment.

[62:51] That being said, I also have children and don't disagree with Brian that when you have to go to mom for permission, there is a chilling effect that occurs there. Certainly, that issue can be looked at. Even prior to getting to that, it would be helpful to begin by having constructive dialogue and activities within the boundaries of the Wolf Amendment as a starting place to see where we might go after that.

[63:18] That process is beginning, but I could be wrong. I would have to get my facts there. I hope none of that is hypocritical, but I would invite you if part of this is hypocritical to comment to me now or later. Later.

[63:31] [laughter]

Victoria: [63:31] [inaudible] . Any other thoughts [inaudible] and Lincoln?

Lincoln: [63:37] Hi. I would like to respond to a couple of comments. I also agree that words and language really matter and we have to be careful with the types of language we use.

[63:49] Even, for instance, in my own comments when I was trying to emphasize the state of US-China relations and characterize them as much better and more complicated than in the past, you're still even talking about the same rhetorical framework of the Cold War paradigm, which I don't believe exists.

[64:07] That said, I believe my own comments may have used the word domination. When I use that, it's for my information dominance that I was talking about. It's actually referring to writings from the People's Liberation Army. I don't have the citations, but there's the winning war under informationized local conditions, etc. These aren't completely out of the blue. This language has been used.

[64:28] That said, I recognize that China is, of course, made up of different bureaucratic actors and the People's Liberation Army doesn't speak for China. You have to think about which actors

are relevant. Another comment I will talk about, and it goes back to my talk about status, we're talking about China being recognized as being part of a group or a league.

[64:51] This goes back to this idea of dominance. In a lot of conversations I've had over the past year, one thing that has been interesting has been how I have recognized that a lot of Chinese individuals that I've spoken with understand status. In a lot of the discussions, it's about equality. It's not about domination. Now, whether that's true or not is something that needs further investigation.

[65:13] It is important to think about the assumptions we're bringing into these conversations, and the way we tend to categorize the other. One last note, I will talk about the idea for UN experiments. I don't know how politically palatable it would be for the United States to do this after denying China access to the space station.

[65:36] I think this could perhaps be an important window for the United States to informally recognize that China is a member of the international community. I'd be interested in hearing some comments from the rest of the panelists about the viability of this. Thanks.

Victoria: [65:54] Other questions? Let's try this side of the room. Marcia, in the blue right here.

Marcia Smith: [66:03] Thank you. Marcia Smith, SpacePolicyOnline.com. I wanted to ask Patrick about the current cooperation between NASA and China on the lunar far side. Not dark side, but far side lander.

[66:15] [laughter]

Marcia: [66:15] There is no dark side of the moon, except when there's a full moon facing one way or the other. Anyway.

[66:22] [laughter]

Marcia: [66:23] I'm just curious, was that a new agreement that went through some process with Congress, or was that under this existing agreement that you said gets renewed every three to five years? How far does it extend? Is it forever for future landers, for us and them? Just how extensive is it?

Patrick: [66:43] Thanks, Marcia. What you're referring to is, during the Chang'e-4 Mission, there was an opportunity to use the NASA asset, the Lunar Reconnaissance Orbiter, which is currently orbiting the moon, to image the landing of the Chinese spacecraft. We wanted to coordinate with Chinese government. Mike's correct. What's known as the Wolf Amendment, it's not a total prohibition.

[67:16] There are instances where the process is laid out in the legislation. Who do you talk to? How do you get certification? You have to ask Congress to communicate with Chinese authorities. That was done. The types of coordination that were involved, there wasn't a formal

agreement. It was more of, we are going to be orbiting around the same time that you'll be landing. Is there something we could do?

[67:43] Could we image the landing site? Things like that. It was reasonably successful. There was no pictures of the actual landing. There are images available at the LRO website, which is hosted in Arizona. You can take a look at the images that were captured by LRO of the Chinese landing site.

Marcia: [68:07] Was it narrowed just for that one mission?

Patrick: [68:10] Yep. It's a start.

[68:13] [laughter]

Victoria: [68:18] Other questions? Right here.

Alex: [68:23] Thank you. Alex Boyed, policy analyst at the US China Commission. I have a question about China's 2016 space white paper. One of the goals it mentions is to establish what I believe is a reliable and stable advanced space infrastructure. Is that right, Miss Julie? From the paper?

[68:39] That sounds like what the various space policy directives that the administration has released are getting at with the streamlining of space traffic measure and things like that. My question is, are these goals in line with each other? What is the extent to which we should or can be working together for a burden sharing, within, of course, the constraints of the Wolf Amendment that we've discussed previously.

Victoria: [69:01] Thank you. Thoughts.

Brian: [69:02] It's interesting you made that connection. Certainly, the US in the last few years, dating back to the 2010, [inaudible] has been talking about space traffic management in the national level. I don't think the US has thought of that in infrastructure capacities, more of a regulatory capacities. Article 6 or [inaudible] capacity.

[69:34] There also have been some discussions of space traffic management within UN COPUOS only within a legal subcommittee, but I'm not aware of any really specific Chinese positions on it there. I think most countries within UN COPUOS are trying to figure out what it means and what the intent is. There has been some proposals for data sharing, for example, from the Russians and a couple others.

[70:04] The US is the only one that I'm really aware of that's pushing or spot this though and is talking about things.

[70:11] I will say that what the US is talking about, what's outlined in Space Policy Directive 3 is essentially, a process to establish a national space traffic management regime that is a mix of shifting SSA capabilities for a civil safety spaceflight to the Department of Commerce, plus

broadening and modernizing the oversight licensing framework, which will be based on industry standards.

[70:42] The goal would be to [inaudible] that internationally. The challenge of that national first approach is it would then mean that every country would just follow along. Every country have to put in place a national regulatory infrastructure and some national capabilities. You figure out how to harmonize and how to synchronize between that.

[71:04] Most countries aren't even there yet. Very few even have full up national space law regulatory policy in place. That will be a challenge. I know China has been working on putting forth a national space law and regulatory regime for a few years now. They're very close to pulling it and bringing it out. I honestly don't know if they thought about space traffic management. I don't know if they're thinking those things.

Audrey: [71:34] I'll add something. I don't know if this is really getting after your question. Just to build on what Bryan said, I think Victoria, you brought up multilateral engagement in some of your remarks when you opened up the panel for questions. That's something that none of us in the panel talked about.

[71:50] The fact of the matter is there is quite a bit of engagement between the US and China within a multilateral context, is really the right way to say it. In the particular example of UN COPUOS where these long-term sustainability guidelines were negotiated, the major spacefaring nations are frankly the ones who have the strongest voice in a lot of those discussions.

[72:16] We, frankly speaking, have the most advanced practices with regard to space operations. Within the US, our objective was very clear to try and promulgate what we believe our best practices...I'm getting confused. Our is O-U-R, A-R-E. Our best practices, we believe, are some of the best practices internationally for safe and sustainable spaceflight.

[72:48] I would say in the similar regard, if China wanted to try and promulgate its practices, it has opportunities just as the US. Russia in particular was very vocal in the UN COPOUS debate, as well as others, France, Japan.

[73:06] Again, I don't really know if this is getting at your question, but there are opportunities at the international and multilateral level to harmonize across the major spacefaring nations to create common standards and frameworks for space activities.

Victoria: [73:22] Other questions? [inaudible] Bruce [inaudible] .

[73:23] [pause]

Bruce McDonald: [73:23] Hi, I'm Bruce McDonald. I'm a space consultant adjunct at Johns Hopkins SAIS. Worked on space issues for quite a while in my federal career. [inaudible] a comment that they made earlier about trying to control technologies that are becoming quite common, who here remembers the old V-chip?

[73:59] [laughter]

Bruce: [73:59] Keeping that? Sometimes people learn something early on, and they don't give up with what they've learned. I'm all one for really sensitive technologies. Of course, we have to be careful with them. When it's released to the larger world or the larger world has passed it by, all it does is cripple our capabilities. That's my comment.

[74:22] My question is that the Indian ASAT test two days ago was a very timely and a very significant event. I'm glad to see it get the attention that it deserves. It highlights for me a couple of areas, where in the course of my career, I've seen this ongoing hostility in the space world, at least the military space world, of restrictions.

[74:48] That concerns me. I was one who thought certainly a code of conduct is something that would not be that difficult to agree upon. Yet it's amazing the resistance within the US government circles about that, that was seen as covert arms control, and that thing. These issues are going to be with us. I always thought Europe is the space leader. No. It was the United States.

[75:23] Europe picked up the baton, because the United States fumbled it, basically. Our allies are looking for leadership. When we don't provide leadership, we see this happening -- I'll be careful what I say here -- in other context, national security context within the United States, the way we've been treating our allies.

[75:43] What can we do to not pick up the idea of arms control at the exclusion of larger security considerations? There are reasons to be, at least, careful. By the way, China has not exactly covered itself with glory either. I have no particular grief for they've been pushing with Russia.

[76:04] What does the panel think? What do people think about what we can do to, at least, give some kind of norms and codes of conduct a push so that we can see some progress in this area? Thank you.

[76:17] [laughter]

Audrey: [76:17] I am sighing because I feel like I get asked this question probably in every panel. I always give the same answer. Obviously, it is not a satisfying one if I keep getting the questions.

Bruce: [76:31] I've been in your shoes before, so I feel for you.

[76:35] [laughter]

Audrey: [76:35] Well, thank you, Bruce, because you'll have to be patient if I give you the same answer I gave you last time you asked me this question.

Bruce: [76:46] Oh no.

Audrey: [76:47] Look, I'm a very strong believer in the role of norms and standards to start to bring some predictability and stability to what happens in space. That's well recognized actually in the US Space Traffic Management Policy, SPD3.

[76:58] It talks about the development of norms and standards, of going back to National Space Policy PD4. It talks about sustainability and stability in space being part of our national interest. US policy in that regard is actually quite clear.

[77:12] Now in terms of the practical answer to your question of, how do we actually get there, my view is that we need to focus on safety and sustainability practices, and not focus as much on the security dimension because I think that's where you get tripped up politically.

[77:32] With the growth in commercial activities in space both what had already happened and what is projected to happen, I think there's a real opportunity to focus norms, if you will, less on reducing tensions between states and more on how do we make space a safe and predictable operating environment for anybody who wants to go up there?

[77:56] If those kinds of norms and standards became more routine or more acceptable, I suppose, that would actually benefit those security relationships as well because those activities that were abnormal would be more visible, which, of course, for us helps our ability to detect potentially hostile activities.

[78:17] Just creates a more stable operating environment for the Department of Defense as well, who has humongous constellations of satellites upon which we rely as well.

Bruce: [78:27] Audrey, I just want to say that's one of the best answers I've heard to that question. Good job!

Audrey: [78:35] Thanks, Bruce. I've practiced it.

[78:33] [laughter]

Victoria: [78:35] Fifth time's a charm. Mike.

Mike: [78:37] I think that the NGOs and some academic entities have a significant role to play here. The challenges we've seen, the rise of commercial space, if I can call it that, is the COPUOS. These were not institutions that were set up to accommodate commercial players. There's no seat at the table for companies at COPUOS. It's done on a country basis.

[79:02] Yet we have corporations as dramatic players now on the international space stage. That needs to evolve and to give a shout-out to our host here at Secure World Foundation. For example, DARPA CONFERS is a great example of an effort where we're trying to look at these norms and standards, etc.

[79:22] The Hague Space Resources Working Group, to go back to it, which I've been a member, we've got China there, representatives, Russians, Japanese, Mexico, etc., all having a very productive dialogue with companies at the table. That's why I love that hybrid of both

corporations and governments talking together. This is ultimately what you have to have to get this done.

[79:48] We've been looking at the rules again for resources utilization and getting everyone internationally on the same page. I think that's very important. Then just let me close relative to anti-satellite. There, I'm biased given where I'm coming from, but satellite servicing can be very important there as a deterrent to ASAT and active offensive weaponry in space.

[80:13] If you've got the ability to refuel and repair satellites, that dilutes, if not starts, to eliminate the efficacy of offensive capabilities. I'd really like to see us reach a point where people just say, "Why even bother with ASAT?" We can refuel satellite. We can dump out a bunch of LEO satellites. I hope that we create a more peaceful environment in space.

Victoria: [80:34] [inaudible] Lincoln then Brian.

Brian: [80:43] OK.

Lincoln: [80:43] To indirectly get at this question, I think it's interesting, going back to the theme I've been emphasizing about status, some of the language that was used around the Indian ASAT test. A lot of this was about India has joined an exclusive club. It's interesting because not just based all this repeated in American newspapers. It goes to the positive spin or connotation.

[81:09] It's a theme we've been talking today about the important role of language. Codes of conduct, these types of standards and norms, they are very important. Even on things that we usually think of as intractable security issues, we have been able to stigmatize certain behaviors. Nuclear weapons used to be seen as a symbol of what it means to be of great power.

[81:32] While there's a certain a community around this now that's established, that's on UN Security Council, it is now seen as something that is a rogue behavior. If you acquire a nuclear weapon, you are outside the system of what we consider to be a responsible intra-power if you develop this kind of systems. The banning of landmines, something is in the intrinsic interest of a security-seeking state to have this.

[82:00] We have a ban on landmines. It's interesting. For this latter case, a lot of dialogues were led by NGOs, activists, and scholars. It's interesting perhaps for some of these more politically intractable questions, something like Track II diplomacy or Track 1.5 dialogue, maybe that would be a starting point to start these types of discussions. That's just [inaudible].

Victoria: [82:21] Brian.

Brian: [82:22] Yeah. I whole-heartily agree with Audrey on the need to focus on safety in spaceflight and working out those rules like a critical environment. To tie with what Mike said, as this commercial satellite servicing [inaudible] industry grows, there's going to be a need for ways to discriminate between that commercial activity and the use of some of those same technologies for military stuff.

[82:46] How do we make that distinction between the two? We don't want to stifle the commercial stuff. We don't also want to keep tabs on stuff that may actually be a potential threat. I don't think we can just focus on those and ignore the military piece.

[83:03] If a commercial satellite runs as a commercial satellite, that is not going to possibly trigger a nuclear exchange or not going to trigger a wider conflict on Earth. That is the risk that comes out of the military-to-military engagements. Like I said, they are already going on in space. People are testing stuff. People are doing close approaches for probably intelligent purposes.

[83:24] The motivations and the intent are not always clear. That can lead to a very dangerous situation. As far as the norms of behavior, it was interesting, in the wake of the Indian satellite test, there were several commercial companies that've come out with some pretty strong statements condemning it. That's not the kind of thing that we should be doing.

[83:51] I have not seen anything from governments doing the same thing. That speaks to the emerging power of the commercial sector as a player in influencing behaviors in space. Right now, it appears the norm is it's OK to test that as long as you try to minimize space debris. I don't think that's a norm we want to have, but that appears to be what the norm is.

Victoria: [84:22] All right. Again, to use the power of authority to jump in here. I don't think there's going to be one way in which you establish norms. There's going to be a whole different types of approaches, commercial, NGO, academic. Again, this is maybe the Secure World perspective, don't forget multilateral.

[84:39] It has been difficult for the past several decades because space has been stymied by other security considerations in the UN context. However, there are a couple of different ways in which things are actually moving ahead. Things are a little bit different now. You have the UN Disarmament Commission bringing up space security as part of its two-year mandate in 2018 to 2020.

[84:57] You had the CD just had a working group discuss space security. Going on currently, right now, in Geneva is a group of governmental experts, which is a very UN thing at 25 countries, in States, Russia, China, India and others, talking about how to prevent arms race in outer space for space security. They're finishing up probably right about now. It's by dinner time in Geneva.

Audience Member: [85:18] They're done.

Victoria: [85:18] They're done? Yeah.

[85:19] [laughter]

Victoria: [85:20] Perhaps in more than one way.

[85:21] [laughter]

Victoria: [85:22] However, having said that, the goal of the GGE is to have a consensus-driven document. In my opinion, the more chances you get to get together and talk about these issues and increase transparency in terms of intentions, ideas, and approaches to space security, that could only be a good thing and a helpful thing. Whether or not we get a document out of that, we will see. Fingers crossed.

Audience Member: [85:43] There's not one.

Audience Member: [85:44] No.

Victoria: [85:44] Yeah, I figured.

[85:46] [laughter]

Victoria: [85:46] That was my prediction, but it was time well-spent as well. Other questions? I think we have one at the back.

Roger Cochetti: [85:55] My name is Roger Cochetti. I work with private equity in the technology sector. One of the striking things about the panel's discussion and any panel one goes to one, this topic is a pretty much unanimous agreement that there is no possibility of the law being changed or the basic underlying policy being changed. I find that striking.

[86:22] Each year, I keep waiting for somebody to say, "No, this may change," but it doesn't happen. I have three quick questions in that context. One is, has anyone ever seen polling data on this topic? Another that strikes me is if you would ask the American public, "Do you think United States and China should cooperate in exploring outer space?" the answer would be 99 percent, "Yes," or something like that.

[86:47] Secondly, is there any other country that complies with the US approach or takes the US policy? Thirdly, have there been any, I'm not sure the term is unintended consequences, but counterproductive consequences of this policy?

[87:09] For instance, I heard one time that this has caused China to cooperate more with other countries in its space program such as Israel, Japan, Korea, or whatever, which was not only unintended but is counterproductive to the world policy. Any polling data, any other countries that do this, and any counterproductive consequences? Thank you.

Brian: [87:36] I'll start in that. I think it absolutely is possible to change the Wolf Amendment. It should be changed. The politics of it, I don't think we can go just get rid of it, but certainly we could look to relax it or positively prescribe some areas in which NASA could engage in cooperation with China without having to ask permission.

[87:59] There may be a few others where they have to ask permission. It's important to think about the politics of how it came about. They came about because of one highly-motivated individual who's in a position to do it and the way that our Congress, most politicians work. The

highly-motivated people on a certain topic can outlast the others who just say, "Fine," just go along with it.

[88:19] By that measure, if there was one or two highly-motivated people in a position just thinking about it now, they can probably get it changed or at least, get relaxed or clarified what is possible. It's totally within the realm of possibility. Whether or not the public cares about it, I don't know.

[88:37] I'm a skeptic when it comes to the value of public opinion in motivating space policy change. It's hard to find that rising to the top of what people care about, at least what they're going to vote about on the top three source of things. I do think it's possible. We probably should consider that.

Victoria: [88:57] Mike.

Mike: [89:02] I saw a documentary about the flat Earth. That's scaring me about public polling right now...

[89:06] [laughter]

Mike: [89:06] like with China raising the top. Let me say again, though, that regardless of where we go with the Wolf Amendment, I think some opportunities of demonstrating that we've been able to successfully interact under those auspices is a great foundation to begin from.

[89:26] If we show that we can operate under Wolf, then you've got a foundation to potentially build to other things. Like all relationships, we have to show that we can operate in good faith, operate in trust, operate successfully. Then if you've got a strong foundation, you can build a house on it.

Patrick: [89:52] I would say as to whether the amendment should be repealed, I have no opinion. It is what it is. It had both benefits and otherwise. What's affected though, we can talk a little bit about. In the late 2000s, there was some data exchange. We had data exchange at earth science and a number of different areas, and in space science and a number of different areas.

[90:14] The way NASA provides data is free and open. Information from our satellites is freely available to researchers anywhere. We make it available to all US citizens, of course, experts at universities or wherever. That same access points are available to foreigners. Our data flow has remained constant. What was turned off was data flow from China.

[90:42] This is an important norm at the scientific community, free and open access to data. We've tried to encourage this with all countries, all of our partners. Then different folks have adapted it at varying levels. If their data is not being made freely and publicly available, it affects our ability to do scientific work. It affects a global scientific commons because they don't have the data that they could have.

[91:21] That's been one effect.

Mike: [91:23] Patrick, can I ask you a quick question?

Patrick: [91:26] Sure.

Mike: [91:26] Was the farsighted amount of work, was that the first time that anything had been done under the Wolf Amendment before, or were there other examples?

Patrick: [91:26] Yeah. There are some level of discussions. It was not the first example.

Lincoln: [91:37] As for the question on polling data, I'm actually going to be running an online survey on this in May. Hopefully, I'll have some data on that. I am a bit skeptical about how important the public matters on this kind of issue in United States. I get the impression too that on issues such as this, they don't seem to strike closely. This is an opinion, but they don't seem to strike closely to people's everyday life.

[92:04] Party ID, party identification tends to be a strong cue for the preferences people adopt. This would likely vary if it becomes a politically salient topic, who's in power at the time. I also don't think that cooperation with China, not expecting to be a particularly popular kind of a talking point or something that would become salient.

[92:30] That said, I think it's completely open. We can make our own laws. It's completely possible that we could change this, but in the current political environment, it doesn't look very good.

Victoria: [92:42] Thanks. We're running all on time. We have room for maybe one last question up here on the front, yeah.

Robert: [92:47] My name is Robert [inaudible] .

Victoria: [92:49] I'm sorry. Could you please wait for the microphone?

Robert: [92:54] My name is Robert [inaudible] from [inaudible] Partners, which is a investment and financing company for space activities. What encouragement or discouragement should be given to US companies who want to participate in China space activities?

[93:10] [pause]

Victoria: [93:10] You may have stunned the panel, any thoughts?

[93:16] [laughter]

Mike: [93:27] Under the current export controls, you know how you would. That's where we talk about a constructive prohibition. It would be near impossible for the private sector to do so under the current export control regime. That's why you don't have a flat-out prohibition necessarily.

[93:47] It's just constructively and practically impossible under export controls and probably CFIUS. Brian, any other questions?

Brian: [93:57] Just to add to that, my understanding is that [inaudible] enemy space-related, the Obama Administration made a big push to unwind some of the export control issues on space. They moved a whole bunch of space categories to the Commerce Control List from the State Munitions List.

[94:17] In the congressional language that allowed them to do that, they said, "Oh, by the way, the prohibitions are still in place for Russia, China, North Korea, and a couple others." Any kind of commercial engagement or commercial space sales or technologies done in China is going to still have to go through that much more rigorous process. The bars are already been set very, very high for the information.

[94:42] That gets to the effective prohibition that Mike was saying. If that were to change, I would probably say, "Go in, eyes open, and learn from the other industries that are already active in China about what the challenges are, both from [inaudible] standpoint, also from a cultural standpoint."

[95:00] You've got companies that have gone to the China, thinking they can just apply the same business techniques and practices there that they have elsewhere. It hasn't worked because it's a very different environment.

Mike: [95:12] If you're looking to make space investments, I've got many ideas I can talk to you about.

[95:17] [laughter]

Brian: [95:17] One point [inaudible], China does have a growing commercial space sector of its own. They're very interested in fostering their own commercial space sector. They realize it's an area of innovation that could...Most countries realize that they could help boost it.

[95:38] China has a whole set of initiatives. They've got companies working on a space launch, I mentioned earlier, on large constellations, on data, on manufacturing, pretty much the whole gamut of stuff, they're working on fostering their own commercial enterprise.

Victoria: [95:54] Any last thoughts from the panel? Yeah, I was just about to. Secure World employees are contractually obligated to discuss our upcoming conference.

[96:04] The Summit for Space Sustainability will be a two-day event here in DC, the end of June, looking at all the various issues that affect space sustainability, commercial sector, security sector, international organizations, looking at space for human, environmental benefit.

[96:20] You can go to our website at swfsummit.org and learn more about this event. We encourage you to check it out if you can. Please join me in thanking this panel for what's been a very spirited discussion.

[96:31] [applause]

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