

Out of This World: Space and Security

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Participants

- **Andrea Mitchell** — moderator, NBC
- **Robert Lightfoot** — President, Lockheed Martin Space
- **Kari Bingen** — Director, Aerospace Security Project, Center for Strategic and International Studies
- **Heather Pringle** — CEO, Space Foundation
- **Dan Smoot** — CEO, Vantor
- **Nicholas Burns** — Co-Chair, Aspen Strategy Group; Former U.S. Ambassador to China

Nicholas Burns 0:07

Okay, ladies and gentlemen, please take your seats. Please take your seats. Are we ready? Thank you very much. I want to thank Secretary Rice, Secretary Pritzker, Secretary Esper, and Peter for that great panel. We're going to shift course a little bit and talk about the future.

And space is not just the future, it's the present. If you think about, for all the companies in the room, the importance of space for commercial reasons, if you think about the importance of space for human exploration of planets, and if you think about the importance of space for warfare and national defense, and that's why this panel will investigate the world of space and security. We have 4 experts all involved in the future of our presence in space.

Kari Bingen, the director of the Aerospace Security Project at the Center for Strategic International Studies in Washington. Robert Lightfoot, a real leader in this industry as president of Lockheed Martin Space.

Heather Pringle, CEO of the Space Foundation.

Dan Smoot, CEO of Vantor, one of our sponsors. Our moderator is a legendary journalist. who is a very close friend of many people in this room. I think I first met Andrea Mitchell more than 35 years ago. She has been one of our great journalists focused on the world beyond America. And I think as most everybody knows, she suffered an enormous loss with the passing of her husband, Alan Greenspan. Alan Greenspan was a legendary, historic director— chair of the Federal Reserve Bank.

And I thought it was appropriate, as we called Andrea up to moderate this panel, that we stand and tell her how sorry we are, our condolences, and to praise Alan Greenspan for his contributions to our country.

Andrea Mitchell 3:06

Thank you, Nick, so much. I think it's appropriate, especially because Condi Rice is here, who my husband so admired and respected and worked with. And he always thought of himself as a Brent Scowcroft protégé. So, and worked with Brent in the Ford administration before later years. So he loved this place and so many of you. Thank you.

Andrea Mitchell 3:37

It's wonderful to be here. There's a healing quality to Aspen and to the dialogue here and the nonpartisan aspect of this wonderful, this wonderful conclave. And I thank the leadership here for including me again this year.

I want to pick up on some of the threads that we were listening to and look towards the future. with this terrific panel because we're here to discuss the fascinating topic of the changing architecture of space, providing an infrastructure to underpin the economic and military and technological and soft power of our country at a time when Russia and particularly China are challenging us competitively, especially in the warfighting domain, of course.

We just saw China's launch last Friday, I guess it was, challenging SpaceX, but also just the pace of Chinese launches in the past year has just been extraordinary.

So Carrie, let me start with you as director of the Aerospace Security Project at CSIS. What is your analysis of the Chinese capability now? The launch last week, the increasing frequency of their satellite launches. Just one data point.

We were reading that at the end of 2025, there were 93 launches by China. And to put a number on it, there were 370 payloads. By the end of that year, there were 1,353 satellites in orbit. So the pace has just increased rapidly.

Kari Bingen 5:14

Andrea, thank you. Thanks, Aspen Security Forum. This is my first time here, so I'm so privileged to be here and be on this panel.

China's just getting started in space. And that whole theme from the last panel on speed and scale, that's exactly what we're seeing happening across the board in their space sector. The launch that we saw last week, this was a Long March launch vehicle. It's state-owned and operated.

They're chasing SpaceX. They're trying to recapture a rocket and then be able to reuse it. So this is the first time the state had demonstrated that. I know SpaceX, Blue Origin have been demonstrating it for years now. But it was the first time for China.

They must solve reusability. They have grand ambitions in space, not just what the PLA, what the military is doing, which is extensive, but even in the commercial sector. It's as if they've seen what's happening with Starlink and some of these mega constellations. And they've said, I see you, Elon. I'm going to raise you. There are no less than 3 to 4 Starlink equivalent, like 10,000 satellite constellations in the hopper that they are launching and plan to launch.

They have this growing startup system. This is the— I almost— I'll say commercial in air quotes because so much is driven by the state. But they have this burgeoning commercial sector, no less than a dozen launch startups.

They're all chasing, frankly, what SpaceX has demonstrated. So it's quite stunning. Reusability is important because, one, they have all of those satellites that they need to launch, and they've been having trouble. So they need to fix that technically and operationally.

But then also, they intend to compete with us globally. And the way that you do that is you drive down the cost— you figure out what SpaceX figured out, but you drive down the cost of launch. You offer satellite services, communication services, remote sensing services, and you undercut our businesses globally. So that's what we're seeing. We're actually going to put out a report next week looking at their industrial base. They are facilitating, they're industrializing to go big. They're building gigafactories, megafactories, new launch sites, aerospace cities, tech hubs. So we're watching that closely. Will their space sector go the way of electric vehicles, or will it go the way of the real estate bust in the early 2000s?

TBD.

Andrea Mitchell 7:33

Well, just to follow up, are we too solo-source-based? Because You've advocated for networks of hundreds of thousands of satellites so that we're not relying on small numbers of very vulnerable large targets.

Kari Bingen 7:48

Oh, so for the US?

Andrea Mitchell 7:53

Yeah.

Kari Bingen 7:53

So the US, yeah, so the US, as we look at the growing threats to our space capabilities, one of the ways that we're looking at being more resilient having mission assurance is to diversify our space portfolios. We long assumed space was this pristine, safe environment. So we built these Battlestar Galacticas, multibillion-dollar satellites, huge, the size of buses, trucks, et cetera. But Russia and China have gone to school on us. They've seen the military advantage that space provides.

And they've said, we're going to target that. We're going to degrade that. And so they're building a whole suite of capabilities to threaten our space advantage. So we've diversified. We've proliferated our architecture so that rather than rely on 5 satellites to do a mission, you now rely on hundreds to thousands.

So that's one way of increasing protection. But there are going to be other ways coming down the pike too in terms of protection, defense, and even going on offense. And that's a new discussion that we're really starting to have, normalizing, frankly, space weapons and space warfare that we can get into.

Andrea Mitchell 8:57

And Heather, jump in here on, you know, just what our—

Heather Pringle 9:03

I was dying to jump in.

Andrea Mitchell 9:04

You know, on our national security position in terms of our vulnerabilities.

Heather Pringle 9:08

Well, I won't reveal our vulnerabilities in front of a major public audience, but I really think Carrie hit on a great point that we've relied on space for so many decades, and it's been a peaceful domain. And Uh, the systems that we had up there for years and years and years were not prepared for the threats that they are seeing today. And yes, space underpins our way of life. It is part of our economic infrastructure. It is part of our national security infrastructure, how we wage war.

It's part of our exploration. And so we need to protect it. We need to defend it. And the ways that Carrie's talking about it, we have an advantage right now in space, and it's up to us to keep it.

And my colleagues here on the left and right have a lot of capabilities that they can talk about that can give us that continued advantage in space.

Andrea Mitchell 10:12

Dan Smoot, your company is moving into commercial geospatial intelligence in a big way. You know, talk to us about the kind of mapping that is needed in the Ukraine war zone. We, you know, I know you're deployed.

Dan Smoot 10:27

Yeah, we've been in Ukraine since the first day. A lot of people remember when the massing was happening on the border. It was actually, the company was Maxar at the time, now Vantor, was actually taking the imagery of what was happening on the border to actually make it believable that this was actually going to happen.

General Saltzman a couple years ago said something that was really important, And he's the head of Space Command for Space Force. He talked about that warfare is now fought from space. And we're seeing that actively in Ukraine. We've actually been seeing it very actively in Iran as well. If you think of everything from how we're flying drones and using GPS-denied capabilities, that's coming from geospatial information and 3D mapping that we build coming straight off of orbit.

The other things that are happening is targeting. targeting has been well known in the Ukrainian conflict that has been geospatial-based, about how they've actually been able to bring capabilities. And the Ukrainians have been advancing capabilities incredibly fast, but they've been doing it based on a foundation that's been coming off of geospatial intelligence. And I think that that's something that oftentimes is not understood, that things like sensor-to-shooter,

something that the U.S. government has been struggling with for years, they've actually figured out.

Recently, we were on the ground with them demonstrated that they could actually have an ATAC device, which is something in their hands, take geospatial information, understand what a target was, and execute within minutes.

And that is actually changing the landscape of the warfare of what's going on in Ukraine right now. That's also shaping what is going on in the rearmament of Europe. We're seeing that space-based capabilities are now going sovereign, where they used to depend on the international community like the US for capabilities. They're now looking to build their own. And so you're seeing this incredible surge for commercial utilization now to build out these capabilities for the first time.

And so space is, you know, from a defense and intel perspective, has actually become front and center.

Andrea Mitchell 12:20

Are there risks involved in autonomous military targeting, given the controversies over, you know, some of the recent— well, what happened in Iran with the school in particular? We haven't seen the final stage of that report yet. But there is certainly a lot of conversation about how there really is not a human element, or that if inputs are bad— I was in Belgrade when the Chinese embassy was bombed. And that was a bad mapping from the old geospatial command, the old precursor.

So it just seems like some of the— The human element, no matter how advanced we are, is still an issue.

Dan Smoot 13:07

Yeah, so we talk about AI and automation. This is actually one of the most important decisions that we have to work through as an industry, as a national level. From a company perspective, we are going to continue to advance our capabilities. It's the advantage of having commercial and technology advancements all the time. We apply large language models, large vision models into how you can actually automate and understand what are objects on the ground, what has changed happening between buildings and roads, and all these wonderful things.

We're going to be able to get information into the military's hands in very quick form. The challenge we have is actually going to be the men and women in uniform and where does automation start and stop.

But I can tell you from a CEO's perspective in applying this information, this is the one thing that keeps me up at night, to make sure that the information we have on the ground is impenetrable, that we can look at it and we know it's a single source of truth, and that that's what we do as a company all the time. And that is, we're automating it, that those mistakes can't happen. That is a core mission to who we are.

But I do think that the challenge will be for the men and women in uniform of how far and how much do they automate.

Kari Bingen 14:15

Can I?

Robert Lightfoot 14:16

Yeah. Let me add to that. I think what's really important about what Dan just said is, Until we get confidence in those systems, we're going to have to have a human in the loop or on the loop in some shape, form, or fashion.

What's different now than probably 2 decades ago is just the sheer amount of data and intelligence coming down. No human can process that. This is where we're going to be able to leverage these large language models, AI, the different things to give the decision makers—think of them as a decision support tool more than making the decision, right? You can really boil it down, give them some COAs, courses of action that they can take, but you still have that human in the loop until we get that confidence.

It's going to take some time to get that confidence. I believe that. But to your comment about is it risky, I'm not sure there's any part about armed conflict that's not risky.

Heather Pringle 15:08

Yeah.

Robert Lightfoot 15:09

Whether it's done from space, automated or not. So I think there's going to be— you're going to have those those issues are going to occur as we go forward. But I think just— I don't think the general public realizes just how much data is coming down from space today that people have to process, and they have to use that to understand the battlefield, understand the weather, understand everything that's happening. It's all coming from space now, and that's an important thing for us to be able to use these tools to help the people that are making the assessment of that data as it And just from a public perception, I mean, something like Midnight Hammer and the work of the B-52 pilots, it's just so extraordinarily complicated and miraculous, really, from the layman's view.

Andrea Mitchell 15:59

And then there's one mistake, and it blows up and becomes an overwhelming story.

Heather Pringle 16:05

Yeah.

Andrea Mitchell 16:06

That's the public policy and the political dilemmas.

Kari Bingen 16:09

So if I can jump in on this on AI, because when I left the Pentagon, one of the programs under me was Project Maven, which was this AI pathfinder. And I want to separate the technology issue from the policy issue. And from a technology perspective, well, one is you have to start

with a clear operational problem. And Robert hit it on the head. It's you have a lot of data. It's falling to the floor. We need to be able to make sense of it.

use it and make sure we understand if there's value there. But the AI models that I've seen, I mean, they still hallucinate. They still show bias. I mean, we need to make sure that we understand the pedigree, that they perform the way that they're intended.

Once I left government, actually, the first board I joined was an AI test and evaluation company because I thought, man, that's an area we need to pay attention to. Government didn't want to hear it at the time. So they ended up shifting their business model. But we need to think about test and evaluation. And then on the policy side, though, let me say something a little bit more provocative. We just had a discussion on Ukraine.

The rules of engagement for their ability to use AI and automation, that's probably a pretty low bar right now. They're going to take that risk because their survival is at stake. I think we're going to have to wrestle with how do we look at our rules of engagement going forward? What level of confidence do we need to have when life and death decisions are on the line?

Dan Smoot 17:27

Yeah, I think that's a really important point, because they changed their policy. They moved from a very hierarchical belief in how they were fighting the actual conflict, and they moved decision-making to the front. They still have human decision-making, but they actually took away from some of that legacy challenges that they had, and that is actually making it very effective for what they're doing operationally today.

Andrea Mitchell 17:46

I think we saw in the, in the Ankara meetings, the president having more sort of grudging respect for Zelensky. after his tour of— Zelensky's tour of the Gulf and finding a market for his drones and seeing the innovation and the success. Zelensky gave this speech last week saying, as you've correctly noted and the previous panel did, and Secretary Esper noted, that the Black Sea has been dealt with, the battleground is at least stalemated, if not advantage Ukraine, and now it's an air war.

The problem is that, as Secretary Rice said, Russia has ballistic missiles and cruisers and can cause mass casualty events if desperate because of their own casualty losses on the battlefield. And if it's an air war, without interceptors for their Patriots, which are in short supply— Now, Robert Lightfoot, I know that this is not your division of— Lockheed, but just generically from talking to some former officials who were very involved in the resupply of Ukraine in the early years of the war.

These interceptors are really hard to manufacture. The motors, the parts, the precision involved, and there's a long lead time on the supply chain. So, you know, is Zelensky going to get the supplies, the air defenses that he needs now that he has the licensing ability?

Robert Lightfoot 19:17

Yeah, I think that's the challenge, and the previous panel talked about that a little bit. The supply chain, when you get— you don't have to get very deep and we start having challenges. When

the demand signal has been X for a long time and now it's X plus a whole lot, everybody's got to spool up. There's a capital investment. There's plenty going on. I mean, I think the administration's working these large munition ramp deals. We're clearly— Lockheed Martin's clearly part of that, and so it gives us a chance to do that, but we'll see, right?

We'll see where we get to that.

Heather Pringle 19:44

Can I add to this? So when it came to Ukraine and how it was started, it was via land, but it also involved some cyber, and what we're thinking about how it will affect the United States, it will be either cyber or through space, and so the fact that space is a warfighting domain that we have to protect, that we have to have resilient capabilities so that we have eyes and ears on the battlefield, so we can have precise weapons that aren't misguided due to error or jamming or other capabilities.

That's why space is so important today. It's different than it was in the past. And by the way, if you disrupt space capabilities, it affects commerce, it affects transportation, it affects, um, all aspects of financial transactions, which are timestamped thanks to GPS.

And so, uh, this is not the space of the Apollo years. It is, uh, truly a warfighting domain and, uh, staying ahead technologically. And the other point that I wanna really emphasize here, 20, 30 years ago, space was specifically a domain accessible by governments, and now it is 78%, uh, commercially driven. The whole space economy is 78% commercial, and those capabilities that the Space Force relies on, that NASA relies on, are being provided by our commercial sector.

And so understanding their supply chains, understanding their vulnerabilities as well, is important for our warfighting capability and our economic viability.

Andrea Mitchell 21:41

In fact, it strikes me that in Trump 1, there were people mocking the Space Force. And it seems to me it was visionary, that this is one thing that the Trump administration really got right.

Robert Lightfoot 21:56

Yeah, and let me touch on that a little bit because it doesn't take much to look back in history and see where we are makes a lot of— I mean, it's exactly where we should be, right? If you look at our history through the millennia, honestly, it starts with exploration.

The first thing someone does is they choose to explore. They push out beyond the boundaries where they are in space, Think Apollo, think back in the '60s, think the things we're doing today where we're taking humans back to the Moon. We just did it, right? Took them back to the Moon. So exploration itself is the driver that gets us going. So we explore, we find things, whether it's spices in the West Indies, whether it's gold on the other side of the United States, whether it's potential commercial applications in space.

Now I got a business reason to be there, right? And then the next step is, I gotta defend that business reason. I gotta have the opportunity to— I need to protect that freedom so that I can do the exploration, I can do the commerce.

And so it's really just following an example we've seen many, many times. So now as we talk about defending space, it's not just defending our terrestrial activities, it's defending the things in space that allow us to have a commerce and an exploration play.

Andrea Mitchell 23:05

Well, you teed this up wonderfully because you spent 3 decades in NASA. And the fun stuff is Artemis. And that brought this country together in a way that almost nothing has, other than the World Cup perhaps. But I mean, it was just thrilling. And for those of us who were— are old enough to remember the Mercury 7 and the excitement of those popular heroes and of chasing the Russian advantage with Sputnik, when a lot of very small children were thrown into science and math classes that we were not really qualified for because we had to compete with those Russians, those Soviets.

But Artemis was just miraculous. And I was at a concert in Philadelphia, a gala that night. And everybody's on their phones during any breaks. Watching the landing. So tell me about that and the thrill of being part of that.

Robert Lightfoot 24:05

Yeah, I think the interesting thing is probably for my generation— I mean, I was alive when we did Apollo, but for my generation, this was the opportunity to go back to the Moon. But remember, going back to the Moon is only half the battle. Bringing our crews home is what we really got to do. We go there and we bring them home. Same with the warfighters. We want to build systems that bring people home.

This was the epitome of that. We can talk about that. And if you had the opportunity to watch any parts of that mission, we talk about science missions and human missions. And there's a reason for both. We need both. We need scientific missions and we need human missions.

And probably the most human part of that mission was when they dedicated the fresh crater on the Moon to Reid Wiseman's wife who died of cancer in 2020.

If you didn't live that experience with that crew, I wonder if you're human. Right? And it was just amazing to see what happened. And then when we were talking to the crew the next— when they got home, we were talking to them.

And I remember what they said. They said when they came around the Moon, here's that blue dot off in the distance. And the comment was, it's time to go home.

And that's our home. And man, if that doesn't inspire people to think about that. But here's the dissonance, right? We're talking about exploration, the inspiration that you get from a human exploration mission. And then the military applications of space. So it is that strange dissonance that we deal with. But for us, seeing the crew land, I will just tell you, I didn't breathe for like the last 2 minutes.

I worked rocket propulsion my whole life. I'm a propulsion engineer, which means I like acceleration.

I am a huge parachute fan. So my goal is deceleration and make sure we bring them home safe. So when those, when those chutes came out, our CEO happened to be actually sitting with President Trump at a dinner, and they brought a— I don't think you'll mind me telling— they brought a TV in to watch this, and he called me afterwards and said congratulations, and he said that was either gonna be my best day or my worst day.

Andrea Mitchell 26:10

Well, I mean, just seeing the way NASA recovered, retooled from the tragedies, of Challenger and Columbia. I mean, that is, you know, a great agency. It has had its ups and downs, but you pick yourself up and you figure out what went wrong. How complicated is it to even imagine the distance to Mars with a human crew? Just the physiological aspects of How long that trip is?

Robert Lightfoot 26:44

I think we're learning a lot. I've talked to several of the flight doctors that I know from— that deal with this. It is a tough— it's going to be tough. There's no doubt about that. At first, we were worried about radiation.

I think we got ways to work around the radiation. Now we've learned a lot on the International Space Station. That's why we're there. We'll learn a lot on the Moon.

But the physiology that we've learned a lot with exercise so that the last thing you want to do is get to Mars and not be able to walk around. That would be terrible, right? Because your body, your bone, you lose bone density and your body does degrade. But we've got exercise devices. We've gotten pretty good there.

I think it's almost psychological.

You know, you're talking a long trip in a can. And any of you that watched The Martian, right? As a former NASA guy, I thought it was totally unfair. The habitat was already there. There were vehicles to bring them home. I'm like, this isn't fair. But it was a pretty good vision of what's going to have to happen.

Heather Pringle 27:36

Yeah.

Robert Lightfoot 27:37

And the amount of time to go rescue them, those kind of things. It's going to be tough. But I think it's always important for us to— as humankind, it's always important for us to have some vision, somewhere we want to go. Think about all the Arthur C. Clarke novels that are actually reality now.

Andrea Mitchell 27:53

Right.

Robert Lightfoot 27:55

That's the value of imagination and inspiration that we have. And I think, frankly, We can talk about defense, we can shift back to defense if you want, but I truly believe exploration is written

in the human heart. I don't care where you are, where you want to be, that's what we want to do. Whether you're climbing mountains here in Denver, that's what you want to do. I think that's going to drive us to keep trying to get to that ultimate goal of Mars.

Andrea Mitchell 28:20

Heather, I think you want to jump in there.

Heather Pringle 28:23

I'm not shy, sorry. Space is a great unifier. Artemis was a different mission than the Apollo era. It relied on commercial technologies. It had an international crew, Reid, Victor, Christina, and Jeremy. Jeremy was from Canada. And the ability to do that together is truly phenomenal.

And I was at home watching the splashdown successfully, but I got to go to the launch itself. And how many of you watched Artemis II launch?

Yeah. It was inspiring. So I got to see it from Cape Canaveral. And what was remarkable to me was that in front of me was NASA, their families, and the engineers standing out there cheering, doing the countdown. But to my right, were some French individuals who were part of this mission who contributed some of the technologies. And behind me was the European Space Agency who created the module. This was, in all senses of the word, an international effort, a commercial effort, and not just the sole United States capability.

And that is what's unifying and inspiring because we did it together.

Kari Bingen 29:51

Can I just jump in on this? I feel like I started a very Debbie Downer moment. You know, China's on our heels. So let me say something positive.

Artemis, for me, it's also just— one, it was inspirational because I was a kid that grew up with the shuttle and Sally Ride and Christa McAuliffe.

But it was just a testament to how amazing our private sector is. See if Robert will invite you to Colorado. He'll let you crawl around the mockup of the Orion capsule that they built. It's phenomenal. I got to— they only let me touch it. I did not get to go inside. But you think of just exquisite engineering and complexity to be able to pull something off like that.

It's awesome. You look at the other parts of our private sector, the commercial sector that Dan represents. We are commercializing areas of space now that I never would have imagined we would do. Satellites taking pictures of other satellites, collecting signals, on-orbit servicing. I mean, last 5, 10 years ago, if we were to have that discussion, we'd be in a classified facility. But it's amazing what's happening.

Private capital going into an area that only the government funded. So there's just a lot to be, I think, hopeful for. And when you expand the aperture of all of these different companies, you're also attracting more STEM talent to this sector, which is sorely needed.

Dan Smoot 31:06

Yeah, by the way, when you take a picture of a Chinese satellite, you get sanctioned by the Chinese.

Kari Bingen 31:11

You're on the list.

Dan Smoot 31:11

I'm on the list. Our picture was so much better than their picture of us. It was awesome.

Andrea Mitchell 31:18

It's true.

Dan Smoot 31:20

I want to thank Suzanne, she's in the crowd, for posting that picture that got me sanctioned. No, but there is one thing that's very serious is when we think about the rate, you know, we talk about Chinese a lot.

The US is still way out in front when you talk about space innovation and the collective international community that how we're actually doing it. And your organization constantly reminds us of what we need to do to stay out in front. And I think that's really important because it is the innovation that happens between Lockheed or Avantor or any of the companies out there that are doing it that are actually trying to be on the front edge of what we're, you know, doing and how we actually bring that to a multinational level now.

And I think that's one of the things that's been really exciting, especially in the last couple years.

Andrea Mitchell 31:59

Well, I am really excited about just the possibilities here. And not just in the war domain, but what we were doing economically at home with communications and with the adventure of exploration. And the fact that there are 2 women on this panel who know more about any of this than I could have ever imagined decades ago. So just— we're opening up the whole world to young people who are going to NASA camp and getting excited about space camp and possibilities.

So thank you all. It's good to end on a high note. Thank you so much.