



Summit for Space Sustainability

Summit Keynote: NASA Administrator

Jim Bridenstine

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Brian Weeden: With that brief feedback, it's now my great pleasure to introduce our afternoon keynote speaker, NASA Administrator Jim Bridenstine. It's my real pleasure to welcome to the stage and thank you for gracing us with your presence this afternoon.

Jim Bridenstine: My honor. Thank you.

[applause]

Jim: Thank you for having me. It's great to be here, with the Secure World Foundation. It's an organization that I've known now for many years from my time on the Hill. Victoria Samson, I don't know where she might be...Brian Weeden, these are folks that worked really hard on the Hill making sure that a lot of your scholarly research and thought pieces are well known among members on the Hill and, of course, our staff.

I just want you to know how grateful I am for all of the work that this organization does. It's nice to be here now as the NASA Administrator and to be able to talk to you about space sustainability from a really different perspective than I've had before, that is somebody who runs a civil space organization for the United States of America.

A couple of things that I think are important, a lot of people in this room are familiar with our direction now to go to the moon and onto Mars. I'll just talk about that for a few minutes, and then I'll talk more about sustainability and how NASA plays into that.

We are going to moon, sustainably. In other words, this time we are going to stay at the moon. That doesn't mean we are going to have a 1.0 human presence on the surface of the moon for the rest of time when we go. That's not what that's about. It's about having access to any part of the moon at any time. This is a very new idea that not just access to any part of the moon, but at any time.

We're going to go with international partners. We're going to go with commercial partners. We're going to utilize the resources of the moon, which is a new concept that has never been an American policy before, but the hundreds of millions of tons of water ice that is available at the South Pole represents life support. It's air to breathe. It's water to drink. It's also rocket fuel. It's available in hundreds of millions of tons on the South Pole.

We want to go sustainably to the moon. The architecture, of course, we need the SLS Orion, the European Service Module bringing in our International partners. The Orion Crew Capsule, we need the gateway. We need more Delta V. The SLS and the Orion themselves are not going to be able to get to low lunar orbit and then out of low lunar orbit. They can get there but they can't get out.

That means we need more Delta V. We get that at the gateway. That's a critical piece of the architecture, and then, of course, we're looking for the development of commercial lunar landers. In other words, we're going to buy access to the surface of the moon. We're not going to go out purchase, own and operate hardware. We're going to buy access to the surface of the moon.

Now the attempt of all this is to prove the capability. We need to learn how to live and work on another world for long periods of time, because the goal is not to get anchored on the moon. The goal is to get humanity to Mars. That's the objective.

The moon is a proving ground. It is a place, think of it as a way point, but ultimately we want to go on to Mars. That's the objective.

A couple of things, when we talk about stability in space, how does NASA play in space stability? When we talk about National Security in general, in the military...a navy pilot by trade, we talk about the DIME philosophy. Show of hands, how many people are familiar with the DIME philosophy? A good number.

I will share with you what it is. It's an acronym. Diplomatic, Capability...In other words, diplomatic power of a nation, information power, military power, and economic power. Those are four elements of national power that are important.

When you have an issue that you need to resolve as a nation, you can bring all of those elements of national power to bear on a problem to help shape the world in a way that is favorable to your circumstances.

Now, where does NASA play in this? To be clear, we don't play in the military arena. The M, that's not NASA. Certainly we have a stake in making sure that there is security in space, but we don't play in the military domain at all. That's not what we do.

On the diplomatic side, that's where we are really strong. Right now, we have 15 nations that operate the International Space Station and orbit around the earth. Of course, we've been doing it now for almost 20 years.

Of those 15 nations, we've had astronauts from all of them plus more. We've had astronauts from dozens of countries on the International Space Station. We've had experiments from over 100, I think it's around 103 countries on the International Space Station. When you think about diplomacy, diplomatic power, that's really where NASA plays a very strong and positive role.

We've got nations all over the world that are wanting to meet with the NASA Administrator to talk about how we can partner on various projects, not just the International Space Station but Earth science, astrophysics, planetary science, heliophysics, etc. We play, as an agency, very strong in the diplomatic arena.

On the information side, DIME, diplomatic information. This is a piece that a lot of people don't understand or get. Where does NASA play on the information side? I'm going to take you back to Christmas Eve 1968, Apollo 8. We had astronauts in orbit around the moon for the first time in the history of the world.

Those astronauts from the moon broadcast, and when they broadcast from the moon, one out of every four people either heard or saw their broadcast including tens of millions of people behind the iron curtain.

That's a capability that the United States government in 1968 didn't have apart from NASA. When they keyed the mic and they did that broadcast, it made an impact on people behind the iron curtain at a time when it was important for us to be able to get messages behind the iron curtain. That's an information capability.

Just since I've been the NASA Administrator, we landed InSight on Mars back in November. When we landed InSight on Mars, it was on the cover of every newspaper worldwide. Every newspaper around the world had NASA on its cover, this little lander called InSight. It's going to help us understand the interior of Mars. Interestingly, one of the newspapers was a newspaper in Tehran.

By the way, the subtitle of the newspaper, it said, "The Hard Line Newspaper of the Islamic Revolutionary Guard Corps." To be clear, they don't write nice stories about the United States of America.

In this case, when we landed InSight on Mars, it was a great story. It was about what an amazing achievement for the eighth time in human history we've had the ability to softly land something on Mars, a robotic capability to do experimentation.

It also had an entire paragraph in the article dedicated to our international partnerships on the InSight landing. In the article, it talked about the United States, NASA specifically, partnering with France and with Germany and with, I think Spain was in it and Poland and others.

What an amazing tool of soft power. The idea that there are people, young people specifically, in Iran that are going to have a perception of the United States of America that might be different than it otherwise would've been because we were able to land InSight on Mars.

I think that's an important capability for sustainability for ultimately achieving objectives in space that enable all of us to do more and preserving space for generations to come. I talked about the military piece. That's not where NASA plays. We want to make sure that we don't play there as a matter of fact.

The reason we don't play there is because we have great partnerships all around the world, in fact, with countries that sometimes, terrestrial, it's very difficult to have relationships with, namely Russia.

Everybody understands the struggles that we have terrestrially with Russia. At the same time, we've been living and working on the International Space Station for almost 20 years with our Russian partners.

The Russian Soyuz rocket has been an amazing capability for taking our crew to the International Space Station, and, of course, the International Space Station itself is a great capability for Russia to have access to and, of course, Mission Control and all those things are operated by the United States of America. It's an amazing partnership that exists because NASA doesn't play in the military arena.

Finally, the economics piece. I think this is an important piece. When we hear about economic power, a lot of times, we hear about sanctions. People know sanctions. That's economic power. Or foreign aid, that's economic power. Foreign aid is not just about philanthropy. It's about achieving national objectives. It's about shaping the world to the favor of the nation that's providing the aid.

It's also important to remember that sometimes, we have to understand that when we have humans in space, there's an economic piece to that. The cost of wrecking space when you have humans in space gets really high really quickly. A lot of you have heard me make comments about how dangerous it is to do anti-satellite missile tests in an arena where we've got humans in space.

Interestingly, there's a lot of agreement all around the world on that thought because it is very difficult to have a desire to put humans in space and at the same time create debris that could be very dangerous for those humans.

All of that being said, NASA plays, I think, a very significant role in space sustainability. I think it's important that we recognize that NASA is this tool, not just of national power, but of international power to help shape the space that I think is important for sustainability for the long term.

I want to thank the Secure World Foundation for having me. Certainly, what I'd like to do is open it up for questions and thoughts and a dialogue because I do think this is a group with some really good thinkers and people that can challenge me to help me understand some of the thoughts and concerns that you have. If it's all right...

Krystal Wilson: Absolutely. Again, just a quick reminder, Mr. Bridenstine has agreed to take questions very graciously. I will handle things the same as before. If you're interested, please get the attention of one of our two folks with the mics. He will be able to respond. Again, questions, not comments. Thank you.

Walt Everetts: Thank you. Walt Everetts from Iridium. We spoke a lot today about policy, and I'd like your views on how we should shape policy in regards to space situational awareness, STM sustainability.

Jim: Right. I would imagine everybody here is familiar with Space Policy Directive-3, which, of course, focuses on space situational awareness and space traffic management. I have opinions on that, and I support Space Policy Directive-3 100 percent.

I think when it comes to space situational awareness and space traffic management, we have to be careful not to create a regime that 50 years from now has no ability to change or evolve, which is quite frankly how we ended up with the FAA when it comes to the air domain.

When we think about the air domain specifically, 1958, the FAA was created. This architecture of radars and voice communications was the tool by which we could control air traffic. 50 years after 1958, we were still controlling air traffic with a network of radars and voice communications even though data links and other kinds of information were available. We just haven't made the modification.

Now, we are now. Don't get me wrong. I'm not suggesting that we're not, but it just is really hard. Why is it so hard to make these modifications, to make these changes, to evolve? Well, the reason it's so hard is because there is a constituency for all of the different elements of the FAA that deal with air traffic management.

Any modification that changes has to go through Congress, which, of course, is going to protect its constituency. I think when we think about the next generation of space situational awareness and space traffic management, we have to make sure that we are not moving from government to government in a way that 50 years from now we're not going to be able to modify.

What do I mean by this? I think it's important that when we consider this activity, we consider that the idea would be that the Commerce Department could license to a commercial operator. They could give them a license to do space situational awareness and space traffic management. They could give that license to half a dozen or more different SSA, STM providers.

Then, if you're going to go through a launch approval process through the FAA for the payload review process and you need to get that license to launch, to get that license, you have to prove that you have SSA and STM requirements met. Well, how do you do that? You have to get that SSA, STM from one of those licensed providers that the Department of Commerce has licensed, but they're all commercial.

Why is it important that they would be commercial? The intent would be that they would be competing for better data and more data. If they are competing for better data and more data, at the end, you're going to see a lot of evolution in capability rather than 50 years from now having a one size fits all government program that has never changed even though technology and advancements have occurred.

I know that focuses mostly on Space Policy Directive-3. There's been a lot of debate. Should that be done by Commerce, should it be done by the FAA. The answer is it needs to be done by somebody. I support Commerce. That's in the Space Policy Directive. I know the House and the Senate have their own competing ideas on that. Overall, it needs to be done because for sustainability, we have to have that capability.

Carlos Alvarado: Thank you very much, Mr. Bridenstine. My name is Carlos Alvarado. I'm from Costa Rica. I'm the former President of the Central American Association for Aeronautics and Space. We are an NGO that has been working in the last 10 years creating a national policy strategy in Costa Rica but also in the Central American region.

First and foremost, I would like to thank NASA for all the help in doing the launch of the first Costa Rican satellite last year. Thank you very much for...

Jim: You're welcome. I take full credit.

[laughter]

Carlos: I would like to know your perspectives about what will be the role of NASA with emerging nations that we really pursue getting into space to learn from the experience of NASA, especially in the education field.

Jim: I think that's important. When we think about how NASA can help, we talk about this lunar architecture. I think it's important to recognize that when we talk about going to the moon sustainably with SLS, Orion, European Service Module Gateway, landers, all of those elements, it's all open, the way we do data, the way we do communications, the way we do docking, the way we do avionics. All of it is available and transparent online.

If there is a small country that can't have its own moon program but wants to go to the moon, well guess what, maybe you could build a lander that's compatible with all of these different systems and partner with us to get your lander to the surface of the moon.

I think that's one way that a small country could have, in essence, its own sovereign space program, but at the same time not have to build the entire architecture itself.

Now, that's an example regarding the moon. The goal here is to...If all of us are working within the same architecture, then we're going to get a lot more science, a lot more data, a lot more knowledge than we would ever get alone.

If a small country, maybe Costa Rica, maybe another one, if a small country wanted to do that, we would want to partner, and we'd want you to share all your data with the world. That's what NASA does.

All of our science is shared with the entire world, and we do it for free. If there's another partner out there, a small country that has some resources they want to put towards this effort and they share their data, we love it. It's a great partnership. That's kind of the idea.

Of course, there's all kinds of missions, whether it's Earth science or astrophysics where small countries can participate in all sorts of levels, it's important.

I had this question. The other day, I was at the Paris Air Show where all the heads of space agencies from all around the world were meeting. It just so happened that the Women's World Cup was going on out there. Alexi Lalas, of course, wanted to interview the NASA Administrator. I went out and I interviewed with him.

You guys know who Alexi Lalas is, famous soccer player? We went out there. I interviewed with him. He's like, "OK, the United States of America, best space-faring nation. Do you agree?" "Yes, I do."

[laughter]

Jim: He said, "OK, who's number two?" He wanted to know who's number two, who's number three, what's the rank, who's the best. I explained to him, I'm like, "Look, I'm not going to start weighing in on this action."

[laughter]

Jim: I did tell him that what we care about is that people participate. Every nation has a GDP that is of a certain amount, and because of that, they can participate at different levels. What we want to see is all nations participating, and we want to encourage that participation. If they're willing to step forward and participate and share data and share knowledge and share science, then we all win.

That was my message to him. That's my message to you. No, I did not rank the space-faring nations as far as capability.

Woman 1: Hi, Administrator. How are you?

Jim: Splendid, thank you.

Woman 1: There was an Executive Order that came out of the White House about 10 days ago that directed all federal science agencies to decrease their federal advisory committees by one-third by the end of the fiscal year. How will that impact the NAC?

Jim: It will. We haven't determined how it's going to impact the NAC, but federal advisory committees, I think, are important. Of course, NASA gets great advice. It helps give people a seat at the table so that even if we don't go a direction that everybody wants, people feel like their voice was heard. I think it's an important capability.

That being said, they're also expensive. I think as part of good management, the administration has made a determination that they're too expensive for the return. While they're valuable, we don't want to eliminate them. We need to rein them in a little bit because they've grown so much.

Now at NASA, the NAC is required by law. I actually don't think that's the case. We have advisory committees on safety that are required by law, but the NAC is actually not required by law. What we've got to do is we've got to look at what are the advisory committees that are required by law and then look at the ones that are not required by law, and ultimately make the paring down.

Know this, we care about the feedback we get from our advisory committees. We will continue to get that feedback. They might not be as big, and there might not be as many of them as we used to have, but we're going to follow the Executive Order. It's really part of a process of good government in my view.

Andrea Harrington: Hi. Andrea Harrington, Air Command and Staff College. I'm interested if in your view, the level of space commerce and access to space has risen to a point where we imminently need or will need a protection of commerce mission to be carried out in space. If so, what kind of an entity is the kind of entity to take on a protection of commerce mission at this point?

Jim: That's a great question. I'm sure in this group, a lot of people are familiar with Alfred Thayer Mahan, and I think a great naval strategist in American history. The whole purpose of ultimately the Navy is to protect commerce. That goes back to the dawn of time, and it sustains itself even today. Protecting commerce is really...The channels of communication is important for any nation to have that free access.

When you think about national security in space, again, it is in fact the same as national security on the ocean. It's about protecting commerce.

When we think about how many hundreds of billions of dollars worth of commerce are ongoing every day because of space capabilities, whether it's communication, remote sensing, or GPS. I'm sure people navigated here, maybe some people here with GPS, maybe people flew here from all over the world using an airplane that was utilizing GPS. All of these things have enabled commerce.

It all ends up at risk if a nation out there believes that they can destroy space, and by doing so, destroy the United States of America. In my view, and I've been clear about this, and I know not everybody in this room agrees with me, but I've been a strong advocate of a separate space force.

As a member of Congress, we voted on it. In the House of Representatives, the strategic forces subcommittee, it got strong bipartisan support. I voted on it on the full armed services committee, strong bipartisan support. When we voted on it on the floor of the House of Representatives, it got 344 votes, strong bipartisan support. I've been an advocate for it.

I will also say that it's important that we not have an escalatory posture. Ultimately, if we do that, there's room for miscalculation. We need to have the security capability but also make sure that we're not escalatory in nature as we go forward.

I will say when you think about Goldwater-Nichols as a piece of legislation that separated the organized train and equip function from the fight and win wars function, joint combatant commands and whether they're functional or geographic combatant commands ultimately being separate.

Therefore fighting and winning wars, and they report directly to the Secretary of Defense, them being separate from the organized train and equip function, which reports ultimately to a Secretary of the Military Service, Army, Navy, Air Force, and Marines, I think that's an important capability.

The President has moved out on the US space command, which is that joint combatant command functional in nature, and I think that's a good move. I think that it's important that we have an organized train and equip function that would be a space force as well, but that requires a passage of law.

The President has the full authority to create the US Space Command. To create a space force for the organized train and equip function, you have to pass a law. I've been a supporter of that as well.

I think this is important for space sustainability. The idea is people need to understand that you are not going to gain an advantage on the United States by thinking you're going to destroy space because we won't allow it to happen. If you know that you can't get an advantage, then you're not going to make those investments.

We've got nations around the world right now calling space the American Achilles heel, and that's not a good place for us to be. We need to make sure that they understand it is not an Achilles heel, and if you make those investments, you will not gain an advantage.

Krystal Wilson: One more question.

Jim: OK, can we do two more?

[laughter]

Krystal: Yes.

Jim: I'll be quick.

Krystal: I defer to you.

Jim: OK.

Jim Armor: Good afternoon, Administrator. Jim Armor here with Northrup Grumman. I'm on your NAC...

[laughter]

Jim: You mean you were on my NAC.

[laughter]

Jim A: I was trying to sneak up on that question there. As you might expect on a space sustainability summit, we did talk about space debris. Could you address your specific concerns about debris for the space station over the next 10 years or so and if you're taking any specific action in the budget, and if you were looking for increased resources to do even more in the time that is allowed?

Jim: Yeah. Right now, when you think about the International Space Station, we are tracking about 1,250 pieces of debris that are in an orbit that crosses with the International Space Station from time to time. That's significant. We do have conjunctions with those pieces of debris with the ISS.

We have not had to maneuver the ISS from a conjunction event since 2015, so that's a very positive development. It is also true that of those 1,250 pieces, those are only pieces that we can see. With the C-SPOC working with the Johnson Space Center, we're able to see 10 centimeters and bigger.

The biggest danger to the ISS, of course, are all those pieces that we can't see. That's ultimately what should keep all of us up at night.

At the end of this year, maybe at the beginning of next year, we're going to have a whole new level of capability, which you're aware of, called the Space Fence. That Space Fence is going to help us see objects all the way down to maybe two centimeters, and of course, it's going to scare us. We're going to see a whole lot more things that we never used to be able to see.

We've got to be prepared for that. We've got to make sure that we're not constantly maneuvering the ISS based on the new scary debris regime that we're going to see. Those investments have been made. They've been made by the US Air Force. We're going to be the beneficiary of those events in short order.

We have to make sure that as we go forward that we take all of that data and we don't respond to it in a way that's unhelpful because the debris has been there all along. We just haven't been able to see it yet.

It's just something we're going to have to work through as an agency. Know this, there's a lot of debris there. It's another reason I think it's important to have human space flight.

It's important for people to know that when you create debris, you're wrecking space flight for human activity, and that's not a good approach. For whatever reason, people create debris and different people create debris for different reasons.

Woman 2: Hi, honor to have you here. I was wondering about your thoughts on the steps we can take, NASA can take to close the gap that we have in governance that's currently inhibiting our space sector for commercial space, especially for SISLEN or space exploration.

Jim: Explain governance.

Woman 2: Governance gaps, right now a lot of regulatory rules are focused on Earth orbit. What about the companies going to non-Earth orbit and planning missions to the moon, Mars, Venus, and beyond?

Jim: Sure. From our perspective at NASA, we want to enable all kinds of commercial activity. This is going to be a longer...I'll be quick.

[laughter]

Jim: Low Earth orbit, we've got commercial resupply going right now. We've got commercial crew almost ready. A couple of weeks ago, we announced that we're commercializing as much as possible the ISS. We're making a port on the ISS available to a commercial habitat.

We're going to have commercial astronauts go to the ISS on commercial crew vehicles and stay on the ISS in a commercial habitation module attached to the ISS. They will be doing commercial activities that ultimately could benefit from a revenue capability.

We're moving as fast as we to commercialize low Earth orbit in general, the idea being that eventually all of these commercial crew, commercial resupply missions will be going to commercial space stations, commercial habitats.

We think about pharmaceuticals. We think about the idea that we can print human organs in 3D now, the idea that we do material sciences on the ISS, all kinds of immunology experiments, however you say that.

All of these activities that are happening on the ISS are transformative for commercialization. Now, that's all in low Earth orbit. As you identified, how do we go beyond that? When we think about the gateway, the way we procured the first element of gateway, the power and propulsion element...Gateway, think of a small space station in orbit around the moon.

That gateway element, the power and propulsion element we bought it. In essence, we're buying it as a commercial procurement. In other words, we don't own it and operate it and we won't own it

and operate it until it's been on station around the moon. We will have an option after it's proven. We will have an option to take possession of it after it's proven.

What does that mean? That means we have an option to not take possession of it if we don't want to, which means it could become a commercial device. I'm not saying it will. All I'm saying is we're trying to create as many options for commercial capabilities as possible.

When we send our SLS and Orion to the gateway, we want to have aggregated at the gateway a landing system. That landing system is going to be procured commercially. What does that mean? That means we're not moving out creating thousands and thousands of requirements, basically designing the lander from the requirement generation documents.

Then, we're not going to do requests for information and then requests for proposal and then get proposals, do evaluations, spend a year making these evaluations, and then make a source selection and then get it tied up in the courts with protests. We're not doing that.

What we're doing is we're buying access. We're buying a service. Who can take us to the surface of the moon as quickly as possible? We're going to buy the service.

The service is we've got an astronaut on the gateway, and that astronaut has got to get to the moon and back to the gateway. Who can provide that service? That's how we're procuring that.

As far as my first initiative, when I became the NASA Administrator, we introduced the CLPS program, Commercial Lunar Payload Services. 15 pounds, how do we get 15 pounds of scientific instrument to the surface of the moon without having to purchase, own, and operate a landing system?

What private companies can build the landing system? We just want to buy the service. Again, the goal is speed. Of course, now we're under contract with a number of companies. We could be landing on the surface of the moon with small payloads by as early as next year. I'm not saying it's 100 percent certain.

By the way, we've now selected nine companies. We expect some failure. That's an important thing to remember. Anything we do commercial, especially CLPS, think of it like venture capital. The idea here is the investment is low, the risk is high, some will fail, but the payoff if one of them is successful is huge.

It's a venture capital kind of enterprise with the Commercial Lunar Payload Services capability. That's another area where we're going into cislunar with commercial capabilities as an agency. We are working hard every day to do what we can to make sure that we're kind of transforming the landscape so it's not an all government, all the time kind of enterprise.

We're making it commercial. The reason we want commercial is because anywhere there's a profit motive that can sustain the capability, NASA can be a customer. We want to be one customer of

many customers, which drives down our costs. At the same time, we want numerous providers that are competing on cost and innovation, which increases our access.

We want to be one customer of many customers. We want to have numerous providers that are competing on cost and innovation. All of that will enable us to use our resources, the taxpayer dollars, to ultimately go do things for which there is not yet a commercial marketplace. I think all of that is important for the commercialization of cislunar.

One last thing, and this is the last thing I'm going to say, in this room, we talk about sustainability. The Secure World Foundation, of course, has been leading on this effort for a long time. NASA is a partner in this as are other government agencies. I think one thing that's important to recognize is why do we want sustainability. We want sustainability because we want to do absolutely stunning achievements.

We want all of humanity to benefit from space. If we wreck it, then it's not going to be available, not for this generation, not for the next generation, not for generations to come. The whole purpose of sustainability is to do amazing things. What we're doing right now in the Artemis program...You guys are familiar with Artemis. I know you're all space gurus.

Artemis was, in Greek mythology, the twin sister of Apollo. Apollo's twin sister happens to be the Goddess of the Moon. 50 years ago, we had Apollo. We love Apollo. It demonstrated amazing capability, and of course, at that time in world history, it was important for us to get to the surface of the moon as soon as possible.

In those days, it was all test pilots, fighter pilots. That's where the Astronaut Corps came from. There were no opportunities for women in those days.

Well, today, we have this very diverse, highly qualified Astronaut Corps that includes women and by direction of the Vice President, who, of course, got his direction from the President, we're going to go...In 2024, we're going to go to the South Pole of the moon. For the first time in human history, we'll land on the South Pole of the moon, and we're going to do with the next man but also with the first woman.

In fact, the next person on the surface of the moon very well could be, in fact it will be...Actually, I'm not going to declare what the gender will be...

[laughter]

Jim: ...because I see Jeff Foust back there.

[laughter]

Jim: At the end of the day, here's the thing. The next man and the first woman on the South Pole of the moon is going to happen in the year 2024. That's going to happen under the Artemis program, the twin sister of Apollo, 50 years of Apollo.

Friends, this is our moment. This is our generation. We are the Artemis generation. I am the first NASA Administrator who doesn't have a memory of where he was ultimately when we landed on the, July 20, 1969.

I wasn't born for another six years. I don't have that memory. A lot of people in this room do have that memory. We need to create that memory for this generation, for our generation, for my children. I've got an 11-year-old daughter. I want her to see herself as having every opportunity I saw myself as having growing up. That's why this is so important.

It's time to go to the moon under the Artemis program, land on the South Pole so that this time when we go to the moon, all of America can see themselves as having this opportunity.

I just want to say thank you to the Secure World Foundation. Thank you to Victoria. Thank you to Brian and all your great work that you've done on the Hill before I got to NASA. I look forward to more dialogue in the future. Have a great conference.

[applause]

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