Speaker 1 (00:00:08):

[Inaudible]

Nanny Mavis (00:00:09):

Free association of Australia, distinguished lecture. My name is Nanny Mavis and I'm the deputy chair of the Aside AA. Before we start our very interesting format. There are a few housekeeping issues I've been asked to deal with. Please, I will ask you all to be courteous and turn off your mobile phones. I'm sure Megan can come up with a suitable punishment for anybody whose phone goes off during the session. All funding will be

Nanny Mavis (00:00:35):

Canceled for your project.

Nanny Mavis (00:00:38):

If you, we encourage you to connect via social media please use the Twitter handle at ADI FOI, the hashtag ADI FOI, and also on Instagram. And it's in your program. I'm not going to try and read that out. We ask you please not to record this session. It is being professionally recorded and it will be made available to you by the space industry association and the Festival of Ideas. So just a warning that tonight's session will be recorded, both video and audio. So on behalf of the NCAA board I'd like to start by acknowledging that the land we meet on today is the traditional land for the garner people and the, we respect their spiritual relationship with their country. We also acknowledge that the garner people as the traditional custodians of the Adelaide region and that their cultural heritage beliefs are still important to the living garner people today.

Nanny Mavis (00:01:35):

I'd also like to acknowledge the organizers of the festival of ideas for walking, welcoming us within their program. What a perfect subject for a festival of ideas, for nothing excites new ideas, like space from the exploration of our solar system, to the use of space, to manage our earthly resources, space, stimulates new technologies and applications. It motivates students to study science, technology, engineering, and mathematics. It challenges our lawyers to develop new legal frameworks. It inspires our artists and provides new business opportunities. Australia is rich with talented and creative people working in the space industry. Yes, I AA has been bringing these people together and advocating their needs for 25 years. And now we have more than 170 members nationally in September last year, the SIW hosted the international astronautical Congress here in Adelaide to showcase this expertise to the world. This Congress attracted more than four and a half thousand of the world's space experts. These are double, I was thrilled that the government chose this global stage to announce the establishment or the Australian space agency.

Nanny Mavis (00:02:48):

The sow advocated for the establishment of an agency in its 2017 white paper advancing Australian space outlining both the need and the benefits of the agency, but pleased that the government acted on this advice. And on the 1st of July knew a few weeks ago, the Australian space agency came into being such an ambitious endeavor, which carries with it. The expectations of a nation requires an exceptional leader, and we believe Dr. Madan vegan. Clark is the perfect choice. Dr. Clark has a distinguished career in the mining sector before leaving CSRO. She has served on the prime minister's science and

engineering and innovation council, as well as the prime minister's task force on manufacturing. In 2014, she was appointed the companion of the order of Australia for eminence service, to scientific research and development through fostering innovation, to science administration, through to strategic leadership roles and to the development of public policy for technological sciences. This experience made her an excellent choice to chair the Commonwealth government space policy expert reference group, but also included out it's like AA chair, Michael Davis. On the 1st of July, she became the inaugural head of the new Australian space agency. It's my great pleasure to welcome to the stage. This is SIW distinguished speaker, Dr. Megan Clark

Nanny Mavis (00:04:20):

[Inaudible]. Thank

Dr. Megan Clark AC (00:04:20):

You very much. And thank you for that warm introduction. I also wanted to acknowledge the traditional owners, particularly as we're talking about Australia's future in space. I think it's wonderful to look back tens of thousands of years. And I don't know, the garner people had a wonderful connection with space. In fact, from their stories, according to to Dwayne how much are the people of the Adelaide Plains saw the great Milky way as a winding river with the huts alongside the edge of the Milky way and the dark patches of the Milky way. They saw her as the deep swirling and dangerous parts of that river. And the Southern cross I saw as one of the great Eagles will do so wonderful connection. I think it's a real honor to deliver the SIA oration. And in particular, I wanted to thank the very many people who every step along the way, made it possible for us to have a space agency. They worked tirelessly for many decades, but if those people are here in the room and I just want to personally thank each and every one of those people who actually made this possible

Nanny Mavis (00:05:57):

[Inaudible],

Dr. Megan Clark AC (00:06:01):

We literally started just harder a week ago. So it does seem very new. I continue that we are absolutely excited that after the efforts of many we can we can get to get going. I have to say on a Monday morning, which was July, the second we'd get up to start. We literally wandered around in circles for about an hour because we'd worked so hard for that day and suddenly it was here. So we can let the teams that are walk around for bits and rockets it. Now it's going to get to work satellite. We, we are so keen to do our very best to serve this nation, but to also serve your vision, we listened to the vision of the nation. When you do something like this, I think the nation is very wise. And so when you listen to them, wisdom of the nation, and we simply reflected that simple and very coherent vision back to the government, what, what could be simpler.

Dr. Megan Clark AC (00:07:04):

And of course, I was very lucky that the nation had a very single voice and knew exactly what it wanted. I think it was born a little bit out of frustration. So it knew exactly what I wanted and that was delightful. I did want to acknowledge, and I've said to Michael Davis, who's the chair of it side. He was part of the expert review group and a wonderful wise counsel for the team. And of course, Tammy may have is the deputy chair and where this, the deputy Lord mayor as well. And he's with us tonight. So I just wanted to acknowledge that like many of you I welcome the resoundingly $300 million investment by the federal

government in the space sector, in the main budget. It was not just a commitment to the agency, but this was a very strong and firm statement to the world that we were very serious this time.

Dr. Megan Clark AC (00:08:00):

Also the government support and all key recommendations, all of the review into Australian space industry capability which was really the nation's voice. The budget had $260 million to do three very important projects. And I just want to quickly outline those for you. 161 million went to geoscience Australia. So lift up our GPS network, that network that allows us to know where we are with our phones, et cetera, all those GPS chips that sit in so many devices, we will behind the world. We had five, 10 minute accuracy, and the rest of the world was a lot more accurate in how they positioned this investment, this, that accuracy to 10 centimeters, some very big 10 centimeters across all of our land across all of our maritime jurisdiction and across that. Yes. So that brings us up to world-class Dan, about what the budget did was going even further and provided $64 million.

Dr. Megan Clark AC (00:09:05):

So the generic capital cities by using the additional model fond networks, you can do additional corrections and we will have three centimeter accuracy from GPS that is going to be worldly. So not only did we catch up, but we've put that infrastructure in place that will allow us to be world learning. I'm going to show you that sends a very strong message to the world. Budget also provides 37 minutes to commercialized some extraordinary work that's been done. I'll talk a bit more about that later called digital earth Australia, which is something that that we could set the standard for. And I'll talk a bit about that. You also provided the ongoing funding to the Australian space agency and gave us 15 billion to kickstart the international discussions. So a quite an extraordinary investment. I remind people here in, in south Australia, of course you see the impact on the defense investment and the defense will be investing $10 billion in the air space over the next 20 years.

Dr. Megan Clark AC (00:10:11):

And that's, that's a fan fantastic foundation and ballast to growing the industry. So not just a fence, but those companies also supplying into the similar area. So every day, we've almost forget how space is used in banking, how it's used for television. I'm always astounded when you go to the, we farms that sit between Victoria and south Australia, and you see the rows that are planted and the NXT is always planted exactly in between last year's, where the tiny little stalks then protect the seeds coming up. And that is because you can use space to get that kind of accuracy. We forget that all of our African cultures now that dependent on space and Marine vessels, of course leave space to communicate. But we are also unfortunately where 99% of Australians have access to my well fine, but actually not even 30% of our geographic area in this last country has that kind of communication technology.

Dr. Megan Clark AC (00:11:16):

So 70% of Australia, I don't have to say these words to south Australia. Does, you know, what it feels like when you move out of Adelaide? 70% of Australia does not have communications at that. Of course we'll need space, but, but add to that American times jurisdiction, we have one of the largest Makaton jurisdictions in the world, and then add to that area's base and everything moving through it. And you start to realize how important the communication will be. So tonight I wanted to share a little bit about the purpose of the agency. I wanted to also share the strategic partners of eyes and see, and then given that this is the festival ideas I wanted to put to you, that Australia can and should step up and be a

responsible global citizen in space and, and look at how in Marta we might do that space is going to become the defining domain for human ambition for decades to come.

Dr. Megan Clark AC (00:12:18):

And we absolutely must be part of that. As a, as a country, you are able to see has a very clear purpose, and that is to grow and transform Australia's space industry. It's also to, to increase the use of space across our full border economy. Everything we do in terms of agriculture, Mani oil and gas use of spice, we could lead in that our partnerships internationally and nationally critical for this Australia said, we want to be inspired by what Australia can and will do in space. And of course, we need to improve the lives of all Australians and take out place as a responsible citizen. We simply can't do this alone. We're certainly not the biggest, and we're a little late to this party. So our efforts must be on the, by very strong international partnerships and engaging nationally. We really do have to work together.

Dr. Megan Clark AC (00:13:25):

If we're going to run through the legs of giants, I've been really astounded that the response internationally has reinforced one thing for me, we were missing one door in one voice in space. As soon as we had that, what was extraordinary has been engagement, even we might've been up and running. Since since the 1st of July, we are already in discussions for country to country cooperation agreements with United States, with the UK, with France, with Canada, the European space agency with Japan and others are already reached out to us. And that tells us that there's an opportunity there for us and has been actually quite astounding on the other side. But I think there's hundreds of us sitting at the space I have to see, and really there's only a few of us. So it's been of interesting on the positive side, we didn't have one discussion on how I mentioned the country.

Dr. Megan Clark AC (00:14:25):

It was a very large country and, and we said, we'd like to do it and bring it by October. And last week I said, well, that's not going to be possible for us. And they asked after I said, what do you think that's possible for you? And he sort of thought, well, I have to talk to manga, talk to Joe, and then we'll write it up. Yeah, that's possible for us. It's a lot less bureaucracy. We certainly have to open the door so that industry and research can move through. And to do that, of course, we need to understand the strategic priorities of industry and research. So it's not just about building our industry as well. We definitely want to stand up and be in a much more responsible global citizen because we need to be part of ensuring safe and secure operations and space and the intercourse course operations space.

Dr. Megan Clark AC (00:15:20):

And and on earth, we also want to share with all Australians, the increasing use of space. And we want to share with Australia some of the really exciting things that that are going to be happening. And so that Australians can feel proud as we step up and take place. And you can feel proud of the companies of the researchers, of some of the students and some of the stories of the things that they will be doing in space, the one to connect parents and children with their curiosity, that natural curiosity, that they have a space. And [inaudible] curious as why you're here. And I know Mary was saying, she's got a bunch of grandchildren, but she's trying to get curious. We want to connect that curiosity and have it grow because it's certainly an opening into technology and engineering, science, and mass. It's a wonderful, wonderful door, and we're going to do some seriously cool things. And we want to share that as well. We'll work closely, very closely with our federal holidays, such as department of foreign affairs and China, or wherever the we'll work with your science Australia. We'll work with the regulators such as

Acura and Cassa. We'll work with the states and territories and industry to craft national policy and strategy for civil space.

Dr. Megan Clark AC (00:16:48):

A lot of people would argue that we are late to this party. I think I asked them that becomes the only OACD country that doesn't have a such that see. So and it's true. We are late to this party. Many of you would remember Australia's actually into space. Several decades ago in the sixties, we were one of the countries that it was right in there. And then we sort of, I don't know how to put it. We lost the plot and we lost that sense of urgency. We want to get to get that back. But we ranching at a really important time. We're issuing at a time when spaces moving from predominantly the government domain into the commercial development. So it used to be several decades ago, three quarters of all the stylist was in the government side and now that's completely flipped into the commercial. So we're coming into a realm where, how we do that and how we work with our industry has completely changed. And that does give us a blank piece of paper. We set the purpose of our agency to be industry focus. We will be one of the most industry focused agencies.

Dr. Megan Clark AC (00:18:00):

Well, you have to be focused because we're small and we got half a lot of money, but we do. We believe that this is where the future is going. So we're very keen to deliver on your vision, the vision of the nation, and really keen to produce an agency that, of which smaller stones be really proud. I want it some of the strategic priorities. So for the nerds and tech heads, and I know there's some of you in here, I want them to go into a little bit of that and, and share where we think Australia can step up. We have to make choices. We have to make strategic choices. We have to lean on our strengths and also nurture some of the areas where we can lean in the world. We do have a lot of strengths where we are in the, in the earth.

Dr. Megan Clark AC (00:18:49):

As we look out into both the solar system and the galaxy, where we sit at the Southern hemisphere is extremely advantageous to us. We've got wonderful education. We've got an entrepreneurial spirit that kind of can do attitude and, and this can really set us forward, but we've chosen six areas where we believe that we need to the focus. The first of course, as I mentioned is communication three, the waters of the current space industry here in Australia is connected with using spreads for communication. So data, not so much voice anymore because it's, you know, when you make a satellite pool, that that little delay is annoying to us. We didn't use to be 20 years ago. We were grateful, but now deeply annoying. And cyber space being much more used out for us for data, but space. He knows all future communication networks. And when you think of that future, we simply cannot be left out of that future.

Dr. Megan Clark AC (00:19:51):

This is the country that brought wifi to the world. We can't be left out of the next generation of telecommunications, and this has all sorts of things. It includes high-altitude platforms. So I'm putting communication platforms that can sit kind of almost where balloons would sit. So, so not what you would consider space, but much lower, lower down, but can provide instantaneous communication. I think you, my name dad with the football grand finals here in here in Adelaide, it also means things like constellations of smaller satellites that can talk to each other and sit much lower down and can give us much lower latency, which quicker communication and can be resilient and talk to each other at a

cheaper. So you get up and running. So just to give you a sense of that cost, we have our NBN sky muster, billions of dollars.

Dr. Megan Clark AC (00:20:49):

I'm writing say mine's very heavy, sit higher and take a long time to build a set I'd two months. I was recently at at one of the factories in France where some of these, some of these satellites that will go into the constellations can produce one every eight hours. And a matter of fact, in China that produces two a day. That's the difference that we're talking about? I'd say monster two a day is completely transforming in terms of the future, just recently accompany ADBA. With German research group, DLR did a child using laser, so using light using the property of life, but it can also be a way, but it also can, can take packets and packets of data. And they use light. They used it from the lab to a mountaintop. So it wasn't from space to earth, but it wasn't a test.

Dr. Megan Clark AC (00:21:41):

And they got a new record of 13 terabytes of data. Second that I put that into perspective. That's everything that's ever been written in 30 seconds. And I said to a bunch of high school kids, what could you do? We fit in terabytes a second. And even they were start. Cause I said, what? I said, I just got to figure that out. This is an enormous jump in bandwidth, and this is the next generation of windows, certainly next in part of it. We are, as I mentioned you know, 70% of our land mass is not covered by our model networks. And we need to make sure space is part of that very few countries would put in the strategy that they want to have ground stations [inaudible] and I want them to sort of leave that, but it absolutely makes sense for catchy lines.

Dr. Megan Clark AC (00:22:29):

Australia we'd count on 12% of the world's rotation with a perfect place to put the connections from space to connections from earth to space for our part of the world. So that's certainly part of our strategy. We want to attract that we currently host, but they expose communication centers for NASA in tidbit Villa, and for the European space agency, Nasir in Western Australia. And the reason for that I remembered at Saarland NASA was over on that. And I was talking to one of the senior officials and saying, I want him to invest $400 million in Australia to after the facility. And I, Annie gave me this enormous rationale and talk about five minutes as to why this money needed to be invested. And it seemed to me, not really, you know, you wouldn't be invested if you didn't have to. And then he kind of shoved his Charlie says we have to, because Australia looks into the solar system and therefore we need you for all of our solar system missions to be part of that critical network California's in Australia.

Dr. Megan Clark AC (00:23:38):

Then of course, my more sense, more sense to me. So it's a wonderful location for, for that. The secondary was this position, navigation and timing, which is our level, not just the GPS of nine where you are, but also there's very important information to that time. And that's useful the banks as well, SaaS tonic. That's why I mentioned a little bit about that, but that investment from the budget as a symbol, allow us to now fully automatic, everything that moves, whether it's an aircraft, whether it's people knowing where you are, whether it's vehicles at central, we will have the infrastructure, if I position navigation and timing to do that. And we can certainly go forward. That's absolutely vital for our oil and gas and mining and agriculture also for our transport networks, if you've ever been on the transport networks from down and through into Brisbane these are the sort of networks that would be wonderful.

Dr. Megan Clark AC (00:24:38):

We all already have the largest robot on earth, which will be in the automatic [inaudible] system in the pill rub. And when you explain that, when you go to the UK to try and access this, this is, this is an automatic Chan system that is bigger than not a kingdom itself. It starts to make it, make it, to make it real to them. The third area is space situational awareness. And recently Frank Ross from the Brookings Institute did a wonderful paper that outline the state of play around space, situational awareness, which is, which is a couple of things. But importantly, the Demery that's moving around in space and the us air force is currently checking 22,000 pieces of space to that's bigger than 10 centimeters. So it's quite quite large, right? But what's extraordinary is the speed at which they're traveling. And we all have revising this caption.

Dr. Megan Clark AC (00:25:34):

So we used two objects that he don't particularly want to hit on long drives, but these are traveling at 28,000 kilometers an hour. Can you imagine if you had kangaroo at 28,000 kilometers there, can you imagine kangaroos fingered out at 28,000 outside can do a normous damage, not just with something that's, that's that large, that we're tracking and there's 22,000, but when you get down to much smaller specs and I understand that there's a toothbrush and a wrench at this hammer as well. I wouldn't want to be hitting with us at 28,000 kilometers an hour. We've also seen when China in 2007 did a destructive missile test and one of its own assets in space. And that resulted in 3000 pieces of debris that were larger than 10 centimeters. And some of that debris potentially would've would have jeopardized one of China's own assets in the, in space.

Dr. Megan Clark AC (00:26:34):

So I was kind of thinking, does the star in a rig Tesler, is that space asset, or is that space junk going around the sun? So surely that on top of the space, Debra, and we also have the development of anti-satellite systems as a very pressing challenge globally. So, so Australia can respond to some of these challenges. I think firstly, we can develop resilient and advanced communication networks and have constellations resilient, constellations in space that that give us more security than simply a single satellite we can and will become a critical node in the global space. Situational man, it's a sort of need us down here as the earth rotates and we see certain parts of space, more so than leaders because sometimes if if somebody's not looking, some of those assets in space will move and then move back before somebody looks at them.

Dr. Megan Clark AC (00:27:35):

So when needed, when needed for that and guesses as to who might be doing that also we can do advanced on all the technologists. We're just chatting today, here in south Australia, that's doing that because if you've got something coming out two at 28,000 kilometers an hour, then you know, it's going to count twice. You might just want to site a little to the left or side or a little to the right and get out of its way because the satellite or your piece of equipment is incredibly valuable. And of course, I think last of the, a patient where you can become a responsible citizen globally to help with both a rules-based order with the laws and regulations and also the behavioral norms that will be needed in space, we're all responding in some of those areas. So Australia is already expanding and will with the recent relocation of the USC man space surveillance radar, and how it hot in in X mouth.

Dr. Megan Clark AC (00:28:41):

And soon we will have the space of arts telescope for the much higher or that, that we'll use labs as well. I think Penn you'd have developed those times. We'll be tapping on your shoulders for for the next generation of guys, but we've also got, so we will be a key part of that military node and a huge part of the USB latrine tracking and keeping account of that Deborah. But as more and more companies are in space, we also need to provide services to, to the civilian and to the similar space areas. So there's, we've got some middle gyms here that we may be able to expand those gyms to provide that service. It's got things like there's a network around west Australia, Australia, that tracks meteorites coming in from the desert fireball network. We might be able to use that the big square kilometer array telescope can join up the data telescopes in New Zealand and form basically a massive telescope that we can use.

Dr. Megan Clark AC (00:29:44):

And that team tells me we can use that for, for space to every university of new south Wales. It's also got a Falcon telescope and some of the universities like MIT are working with companies on algorithms for all that. So we've got lots of little pieces that we may be able to bring together and and look at how we service a broader commercial ground. We can't do everything at the global level, but I think in this particular area, we did stand by earth. Observation was our fourth area. Now this is where we stepped out of that, or really every other country we spoke to said, yes, we use satellites to look down on earth. And this is fantastic data when you have the moving around capturing different sorts of data. And most countries said, well, we want to set up a series of small companies that can provide better analytics, provide different services, whether it's looking at the ocean, whether it's looking at farms, whether it's whether it's looking, how water changes.

Dr. Megan Clark AC (00:30:44):

And we we actually took a very different track that might not be, we took a different check. And the reason we took a different track is everyone said to us, because Australia didn't have its own satellite. We didn't have our own data that we wouldn't call our arm. We didn't get distracted by that. And therefore we learned to use everybody else's data from that was coming from space. And we learned how to stitch it together. In fact, I think what geoscience Australia did was absolutely extraordinary while other captions were spending hundreds of billions of dollars to put satellites out. Geoscience Australia took 30 to 40 years of data that we already had from satellites from the us Landsat and other satellites they drove. And when I say drive, I mean, physically drove those tapes to the super computer in Canberra and they loaded it all up and they spend 300 to $400 million.

Dr. Megan Clark AC (00:31:41):

And for every 10 square kilometers across all of our land and all that coastal region, they took every one of those images then corrected them. They corrected them for cloud. They corrected them over time, even corrected them because in that time, Australia has moved a little bit north with a plate tectonics that even corrected for that for every one of those tents, but almost a series of views over time. No other country has done that. And it means are that if you're a company or research and you can say, just give me this area, you don't have to bother with correcting or fixing it. And believing as someone who started their life looking at satellite images, it was the fight of my life because nothing quite matched, it all matches. It's absolutely beautiful. And we had to export that technology. So hopefully make that a global guideline or standard.

Dr. Megan Clark AC (00:32:35):

So I think that's been extraordinary. And the investment to do that means that that Australian companies come out and sit on top of that and produce data. That's useful. When I say useful, I saw the most beautiful use of that data recently, where they're taking 30 years of data over a small area and say, let's just look at the water, the lakes, the rivers, the water, the rain, and they shot a Mack of habit over the years. I did this work quickly and beautifully, and it was just Gloria said and that's the sort of thing we can do. We've got some last two areas. We've got some areas of strength in our research, such as our, as title, such as our radio astronomy here in south Australia, of course, you know, the over the horizon right out of work, that's been done by the fence.

Dr. Megan Clark AC (00:33:26):

So we've got areas to leverage that we will stand on their strengths, but we've also got these little kernels, these little nuggets of areas where we know wherever in the world, but if we nurture them, if we support them, we just might be able to, to step up things like artificial intelligence, the robotics, as I mentioned, the data analytics to pull things together. We've got companies here in south Australia, looking at the of things, how they help a dairy or a farm, the sensors all over their farm to be able to use satellites and constellations to access that data and control what they're doing on their farms. We've got companies that are doing wonderful cyber security. How do you make your communication in space secure? Using things like quantum cases in quantum mechanics, we've got some, some wonderful curls of optical laser capability.

Dr. Megan Clark AC (00:34:21):

And particularly here in the universities, in in south Australia, we've got companies that are looking at the very next generation of compulsion, whether it's 3d fuel, whether it's 3d rockets, when printing in Victoria whether it's do propulsion systems and advanced propulsion system. So these are all little nuggets and we think they should be supported. Our last area is one. I think Australia will leave the wall. We call the earth to space, a space to learn Australia leads the world in remote asset management to make, we have control rooms in Queensland and Perth here that control assets, thousands and thousands of kilometers away. And and we have water. We have the largest amount of automatic shocks. We'll have the first trend. We have our offshore oil and gas platform. What we do in Australia will be done in space and what's starting space will be really useful to us as miles drivers.

Dr. Megan Clark AC (00:35:19):

You know, I can see them out in the Flinders range, I really care, but they can be very useful. And that's why that Woodside petroleum company is partnering with NASA. So NASA recognized this capability and said, we're developing Robo-Naut, which is a torso robot sort of from here on out, very dexterous. So a robot has very good use of its house. And and NASA says, we need to use it on the international space station to do maintenance where we're taking the humans out. And what side goes, we've got an oil rig that's about as complicated as a international space station. And we need to do the same maintenance and have two or three robots. And that's exactly where I was talking. I can do this. This is such a glorious partnership. So I can see a lot more of that. Having already our mining industry will of course, link to connect with the space industry and so agriculture.

Dr. Megan Clark AC (00:36:18):

So I wanted to conclude tonight, and I think we're going to have a bit of Q and I as to why I think Australia must reinvigorate our space diplomacy with our allies and with our partners and and also in our region and step up and be a responsible global citizen for safe, secure, and healthy operations in

space. Why, why is this really important? Because space is becoming more contested. It's becoming more congested and it's becoming much more highly competitive than it has ever been. It's also a resource. We don't think of that, but it's, it's also a resource that we need to approach wise. And we need to think about how we do that when new states coming in, when you conscious coming, you mean commercial entities with multi-lateral entities, with even non-state players coming into them, then area, and the access to space is obviously vital. Now, as I've outlined, the access to spice will be more important in the, in the future. Australia's had a very, very long and enduring interest in the peaceful use of outer space.

Dr. Megan Clark AC (00:37:41):

We will want the 24 founding members of the United nations committee on a piece we'll use is around a space, which is called the UN populace in 1959. And let's try and has continuously chair the scientific technical sub committee. So we do actually have a very respected role that just recently, Alex Sonetta from the Australian space agency was that copy of seven present. And when our national statement was presented, which hollered the new agency, but it also reaffirm Australia's commitment to our obligations consistent with the United nations space treaties. We're absolutely committed to strengthening the rules in space, the regulations and space, and also the norms of behavior in space, and then includes the military uses of of space. I think there's evidence for that. We are one of my 16 countries in the world, but it's partly to all five United nations treaties. So we'll work with our partners or work through the United nations committee, multilaterally and bilaterally to strengthen those rules and laws and norms. We're also planning to engage with the United nations strategically in their next strategic planning phase to 2030, and particularly how we use space for, to pursue the United nations, sustainable development goals. Interesting displace. We're going to learn about how to care about our own planet and use space to do that.

Dr. Megan Clark AC (00:39:19):

Plus multi-level obligations and multilateral obligations and our are actually very important as well for industry. And we're in the process as a country of upgrading our regulations, our framework, and our laws to modernize them, to make sure we don't inhibit innovation, but also to balance what we do with our international negotiations. So we had a space activities act of 1998, and that was that's what implements like our obligations under the United nationals treaty. And it established the licensing frameworks for activity in space. The space agency now will look after that responsibility, but we needed to review that because the technology has changed because we don't want to inhibit innovation. Really things have changed fundamentally that cost the entry. The mechanisms, the orbits have all changed. And so we need to upgrade our our frameworks and our legislation. So where are we at with that?

Dr. Megan Clark AC (00:40:23):

My friend, Stephen Freelander, who was also on the expert review drug, did a review of the space activities act and and presented his work in November, 2016. And then in may, this year the Australian government introduced the space activities and be able to fund launches and for returns. And that bill is just putting into, into power. So it won't be debated yet until the spring season, which is in August to December. But it's currently being looked at by the Senate economic legislation committee. I'll find my, as to say those four words in the right order, it's time to practice that. So the committee then looks at, looks at that the committee is receiving submissions right now from interested parties. It will do its report and then there will be work done on, on producing this new regulatory framework. So the idea is they will work on that and we'll engage of course with stakeholders on it's draft, a draft position.

Dr. Megan Clark AC (00:41:33):

So we do have this opportunity as I've outlined to be a global leader and to really step up on, we've got some exciting areas where we think we can leave. I've mentioned, we need to step up as a global responsible citizen for the safe and secure operations in space. And we also need to provide a regulatory framework. Thank you, certainty to industry and allows our industry to be competitive internationally. So no other industry, no other industry can inspire at nationals like space. And you know, I say that because it's where human ambition can set its sights on interplanetary missions. It can set insights on colonizing, considered sites on even finding your life. It can set sights on looking back on it time and taking care of our own planet. And we've been able to dream, I think the speed, because we've seen that technologies that are bringing down the ops, respires have completely transform the way we work and the way we communicate, et cetera, they will do in the future. Thank you very much.

Nanny Mavis (00:42:59):

[Inaudible]

Nanny Mavis (00:43:00):

Thank you very much, Megan. We do have 15 minutes for Q and a. So please, if you put your hand up, if you have a question and we have some voting marks,

Nanny Mavis (00:43:10):

Which one,

Dr. Megan Clark AC (00:43:29):

It's a great question in our discussions with the various agencies, but we're already looking at a potential missions and we're looking at that at the lens on how do we get it straight into the technology industry, but also where those wishes can provide a broader if you like broader value to our, our economy. So we are building a desk. And I think some of the science missions allow you to ask some pretty extraordinary questions. So when we sit and we look at things we're not, it's not about, it's really not about having the budget that someone like NASA does a $20 billion a year to the, of pharmacy LiveChat missions, but we absolutely want to be part of those.

Speaker 5 (00:44:31):

[Inaudible]

Dr. Megan Clark AC (00:44:33):

Certainly not all the way through. So how, how do we capture that curiosity at the very beginning? How do we bring it all the way through the age of Kashi system? And then how do we have the skills that we're going to need for this industry? And then how do you bring back and make sure orange academy, people are married to Kathy and kids. So how do we do that whole loop as well? We, we had discussions today with the Australian government on this particular issue out as well, particularly the skills class. So it's an enormous challenge, but on the other side, it's a wonderful opportunity because you see the way that, that kid's curiosity responds to spice. And so it's just a wonderful mechanism to teach such a role spectrum off, you know, engineering and massive all of us. I have the I haven't been to Hamilton Hamilton.

Dr. Megan Clark AC (00:45:31):

I went to the Victoria space school education center, where they have half the class is on the surface of mask or in their spacesuits in to London speaking. And the other half is in control and I'm dancing to bunches of kids that were more engaged and it would, he, his teams, et cetera, this is phenomenal. And you know that we're going to go home at night and share that with their brothers and sisters and families, et cetera. It was just an extraordinary experience for them. And I felt like I was 10 again. So it was pretty exciting.

Dr. Megan Clark AC (00:46:11):

Okay. It's a great question. I'm actually, that was very nice as it is in Boston, the wire, where it was knocking him out of this wall. So at one end of the spectrum, there was look, we've got lots of moms capacities in it's not a value is the value of care, your assets and despise. That was one of them, this picture and the other expansion. We had a boss sign, we're going to have so much to be denied or a smaller set of lots of constellations that launched. And somewhere in the middle of things like space tourism activities, where are they when we landed in the review was decided that this was not an area that we're making textiles doll. But it was an area where there was a commercial commercial group could see that market could feel it like the centers themselves. Then there was a role for government to support it. So not there. And we were recommending, I think the other aspect is it was, it's just quite hard to see that supply and demand position right now. I think it will develop and we'll get a clearer picture, a picture of that. So I'm not an area that certainly didn't have a single answer.

Speaker 5 (00:49:26):

[Inaudible] [inaudible]

Dr. Megan Clark AC (00:50:04):

With technology, we've seen there's the light in the shadows and you highlighted some of the shadows, some of the cyber risks, which are inviting a lot more, what doing that, I suppose as well highlighting some of the potential uses or space for military use, et cetera. I mentioned that so Andy satellite area, so there are shadows a lot of my thing. It's very important to highlight the shadows as well as the law. So I completely agree with you. And then if you type the shadows, how do we make sure, as you said that those shadows actually you and and what's actually happening, there is a sense of mystery. My discussion on a lot why Australia can step up and should stepped up as being responsible citizen in part is to be, is to respond to some of these aspects in share and in Australia can, can be, it is recognized as a, somewhat of a neutral, broad, or we're not that strict.

Dr. Megan Clark AC (00:51:14):

We we don't have a huge presence, but we also have a significant presence in that region. And I think we will take our steps carefully and we will type of steps slowly. But we do see that as a, I think as a responsibility to my shoulder, we have a role in in, in making sure we're managing our shadows and that we'll feel comfortable in that area. So we can have a whole nother evening on that. But thank you for hollering. As I said, the light in the shower is one of those issues.

Speaker 5 (00:51:50):

Thank you. [inaudible] Some builds on that, that [inaudible] one example is suede Adeline, Dr. Harry Eris, he'll be Lily Amman [inaudible] hi boys. Hi, briefly the positive side [inaudible] and they collaborate [inaudible] your attention to the challenges and the priorities?

Dr. Megan Clark AC (00:52:51):

Well, it was a good staff of the nation. Hadn't had a coherent and single voice, a ridiculous stood up. I've been involved in lots of things. And I saved it, as I said to the prime minister. I'm never been involved in anything where, and not just doing exactly what [inaudible] and if it actually said anyone in government to do something, which was, which was extraordinary. So I think we do have quite a bit non-physician use has been quite a bit of talking to the mayor about a competition that's going on next, the states and territories, but actually when I would with all of the pies and, and he told me is actually an enormous sense of the sense of national view. So certainly what's been tried is not what I'm saying, all the down and out. And the food aspect is how many internationally, this is really a mess ambitions really understand the ambitions on the Frenchies and that Palm is and understand their on and, and share. So that, that sounds very simple. But I see, we can certainly do that and [inaudible] one, they want to collaborate with us. I think there's a real recognition of the ingenuity and smarts. [inaudible]

Dr. Megan Clark AC (00:54:14):

Perhaps we forget that sometimes. And so obviously welcome, society's bringing some of this credit, so there's an opposite of before us, we can't do everything. But we can work with us countries where we have five more minutes

Speaker 5 (00:55:16):

[Inaudible]

Dr. Megan Clark AC (00:55:16):

So it's a great question. And you can probably answer some of it, some of this question of what really struck me was that a has also been advising on the big aspects of human Square's travel for decades now through the work that, that we've really led in the Antarctic [inaudible] tactic and have teams, et cetera. So we've actually been part of this, but my understanding is we've never been able to have this drive a little bit medical officer on last missions as well as, as you mentioned with him, Australians in spreads, but even getting into spice is changing. So now we have the opportunity of space tourism. We have the commercial play as the terms of service and things like the international space station. So we also want to look at what that might look like in the future. Mama look like it looked in the past, it's quite a broad, a broad question and what those opportunities are. And and we're engaging on, on all of those fronts. And one of the thoughts that we had is that you know, I think this drives want to say that. So we're looking at, we're even thinking about how you might dress or 7 25. So all sorts of all sorts of dumb ideas, but importantly, what you is expressed is also the recharge as well.

Dr. Megan Clark AC (00:56:38):

Thank you. Thanks to the last two years on fiercely [inaudible]. And so of course we're a bit nervous, even all that, is that a good place to come in here too, but I'm just wondering when you got [inaudible] who is joining us now, how are you kind of be able to [inaudible] use of this, the military? How can we really keep the faith peace? Because the drug question, because we have our obligations of ascent international obligations, we're working at [inaudible] all the places where his best price. We also have a strong allies one of which, and one of our strongest allies, of course, the United States and a pilot for us.

So Australia has always balanced our international obligations, that commercial relationships as well, without fundamental matching with our allies, honestly, we can bounce was [inaudible] past. And we'll learn to continue to bounce in the future. [inaudible]

Speaker 6 (00:58:15):

Thank you very much. And thank you for that. I have a couple of particular points. I'm the executive. I won the argument about where they personally, I think we should be in Canberra and that each of the states should have a representative for life, because I think he died at the camera. You gotta be isolated in the discussions with other governments. [inaudible] Much more important. The agency, it was a C a stock in those dialogues face to face every day. I think that's really, really important. Second point is about recent legislation of the forum because someone stood up and we thought he could, he would turn up 85. People turned up. We had a lack of seats et cetera, and the enthusiasm, but one Blake stood up and said, I've read this new legislation. Why can't we have it? The introduction, the first page, a statement of a strike as policy should be in spice rather than going into the first clause, talking about some regulation, ally associations, others. So we would like a statement of policy in that legislation. And ultimately one day I finished with the chances of this agency was coming to step on the law established by all of them responsible, direct to a minister in the cabinet, rather than as a section about there's a big spot to report the subsection of the department, choosing stuff. You've already done budget responsibility to a minister. I know in the next four years is going to be a read, but I'll have it. Doesn't take full years to get a positive answer.

Dr. Megan Clark AC (01:00:04):

Thanks, Chris. Thanks for your help.