



# ROYAL AUSTRALIAN AIR FORCE

## Podcast Transcript

### Conversations on The Runway – Space Series Episode 6 – ‘*International Cooperation in Space*’

**Host: SQNLDR Michael Veitch (SCO)**

**Guests: Victoria Samson and Dr Cassandra Steer**

#### **Michael Veitch**

So it's that scene, that classic scene from the old Western. Yes, I know, I like to bend my openings of *Conversations on the Runway* into an arguably convoluted Wild West analogy, but just go with me on this. We're in the saloon. Honky-tonk music is playing on the piano. There are men seated at the bar, drinking whiskey, minding their own business. There is the barman behind the bar polishing glass with a tea towel. There's lots of glass back there, mirrors, rows of bottles. It's kind of fancy. The barman is usually bald but with a moustache, always wears suspenders for some reason.

Then, suddenly, the swing doors part, and in walks, head to toe in black, the bad guy. The honky-tonk music stops. Instantly, he sees his quarry, one of the guys seated at the bar. His eyes narrow. I guess that'd be a close-up. Slowly, people get up, gravitate away from the door as well as the seated man, the only one now still at the bar. But he ignores the bad guy, takes another nonchalant swig of his drink. Oh, we all know what's about to happen. And in a terrible moment, the barman sees the destruction of his bar, his business, his livelihood, the social centre of his small frontier town in, I don't know, Montana or somewhere. No one will benefit from the place being smashed up, particularly him and the people who rely on him. So what does he do? "Howdy, stranger," he offers nervously. "Anything I can get ya?"

From what we've been discovering over the past few weeks on *Conversations on the Runway*, this to me seems to be something like what space is becoming. A place that we're coming to rely on so much for everything, communications, entertainment, weather, disaster relief, that it's now a really fragile environment. And like the bar in the small town, the consequences of it being smashed up are huge. But who's going to talk the gunfighters down? Is it the barman's job? Is it up to the rest of us in that bar? And in the real world, who's that - governments, the UN, Elon Musk? And in any case, are we even now too late? Are the gunslingers already on their way to start an interstellar fight that's going to have very serious consequences for the way we live on Earth? International cooperation in space, is it the universe's biggest oxymoron or a statement of hope for the future?

On *Conversations on the Runway* this week, we're looking up and asking who's playing up there and what are we doing to make sure they're playing nice? We have two wonderful guests today who, while they might not necessarily go with my space Wild West thing, have thought long and hard about space and how to make it safe for everyone. Beaming in via satellite, appropriately enough, from Washington DC in the United States, Victoria Samson is the Washington Office Director for Secure World Foundation, with more than 20 years of experience in military space and security issues, and has also served as a Senior Analyst for the Center for Defense Information and has written prolifically for some of the world's finest publications on matters of space. Victoria, welcome.

#### **Victoria Samson**

Thank you. Looking forward to the conversation.

**Michael Veitch**

Thank you. And please welcome back to *The Runway* Dr Cassandra Steer, Senior Consultant and Lecturer specializing in space law and space policy at the Australian National University College of Law and Mission Specialist with the ANU Institute for Space. Hello once again, Cassandra.

**Dr Cassandra Steer**

Hi. Great to be back again.

**Michael Veitch**

Victoria, since you've either stayed up late or have got up early and are speaking live from America, I will start with you. Is space becoming that fragile saloon bar where the consequences of conflict are very serious indeed?

**Victoria Samson**

Well, space has always been a place of competition. You think about the beginning of the Cold War, it was the US and Soviet Union fighting for eternal supremacy. So I think that some people tend to think things have changed a little bit. What has really changed is that we depend so much on space, and the use of space is really changing, the actors in space are changing, and we're seeing a real increase both in the number of actors, the number of users, and the number of potential space weapons.

**Michael Veitch**

Is our reliance ... Indeed, I'd actually go further and say dependence on space, and with all these other actors coming onto the stage, and our uses for space increasingly exponentially, a growing array of human activities, it just seems to me, Victoria, almost axiomatic that a future conflict between mankind will have to happen in space. Is this a scenario that keeps you awake at night?

**Victoria Samson**

Well, I think nothing is definite, so here's our chance to try and prevent that scenario from happening. But I think it is definitely a possibility that there could be some sort of conflict on Earth extending up in space, or some sort of interference in space capabilities escalating a misunderstanding and misperception on the ground, that could then lead to conflict. So the two are definitely intertwined.

**Michael Veitch**

Indeed. I wonder if it keeps ... And, well, I'm jumping ahead a bit because it seems to me that the commercial and national interests of space are becoming very blurred. Is it something that you think keeps Elon Musk awake, the idea of conflict up there?

**Victoria Samson**

You know, actually, I really hope it does because for years when we talked national security issues in space, the commercial actors would be like, "Whoa, hey, whoa, I'm just here to make a buck. I don't have to deal with these national security issues." But the state and the stability of the space domain absolutely does affect them. And, in fact, the commercial actors have a strong effect on the security of space themselves. There's about 3200 active satellites currently. If you look at all the satellites that are supposed to be launched, probably won't all but a good chance that they will be, but supposed to be launched for the mega-constellations and for the next 10 years, that's 107,000 satellites. So you're seeing a huge increase in the number of satellites. Who's launching those satellites? It's not state actors, it's commercial actors.

**Michael Veitch**

Can you give us that number again? I have to pick myself slightly up off the floor, Victoria. What was that number of satellites that'll be up there in...

**Victoria Samson**

Currently, about ... And, again, it changes all the time because SpaceX keeps launching satellites, but let's say about 3200. 3200 active satellites roughly, currently.

**Michael Veitch**

Wow.

**Victoria Samson**

And if you look at all the satellites that have been asked to have FCC filings, which they need to do to get broadcast rights, there could be 107,000 satellites by 2029. So that's just a huge potential for threats, from misunderstanding, just from a space traffic management perspective, all the launches going up and coming back down, all the trash that could be created. Plus, you have the problem that these are commercial actors doing these activities, and yet how do you deal with security issues when it's commercial actors that are holding the reins, so to speak?

**Michael Veitch**

Well, you've actually written about the potential for non-state actors to carry out some counter-space cyber operations without national state assistance, which kind of does, and I've made the analogy a couple of times, move into the area of what science fiction talks about, private corporations having enormous leverage in space and space defence. Are we seeing that already, Victoria? Is the line between national space interests and commercial space interests becoming very blurred?

**Victoria Samson**

Oh, it definitely is becoming blurred, just because the line between national security space, commercial space, civil space, it's definitely blurred because you have commercial satellites carrying national security payloads, you have commercial satellites carrying communications for national security actors. It's happening all the way around, and so it's really hard to say that one is not going to affect the other. I think there's definitely...they're all on the same spectrum. There's continuity between them.

**Michael Veitch**

Cassandra, communications, entertainment, weather prediction, disaster relief and amelioration. Do you think we can now with confidence add to this growing list of human uses for space national security?

**Dr Cassandra Steer**

Absolutely. And as Victoria said, space has always been a domain in which national security has been at play. So, Sputnik was a military satellite, and then the US in response launched, essentially, military satellites as well. The main, original purposes for satellites was to observe each other. The Soviets and the US wanted to observe each other's nuclear programs in particular, to be able to track from space, from a higher observation point, whether there were nuclear detonations and tests going on; being able to observe by literally taking photographs from space; observe each other's arms stockpiles and that kind of thing. It's always been a key role for space... has been national security. And I think what we've seen is a resurgence in the importance of space for national security in the last couple decades because of how dependent we are on space, and because of how dependent modern militaries are on space. So if you want to take out the eyes and ears of your adversary, a really effective way to do that is to just, even just temporarily, impact their satellites rather than having to attack something on the ground.

**Michael Veitch**

And to that, the notion of conflict in space, counter-space capabilities has developed its own nomenclature. I've been trying to get my head around it. I wonder if we could have just a couple of thumbnail sentences about the five categories that counter-space capabilities seem to fall under: direct descent, co-orbital, electronic, directed energy, and cyber. Victoria, just pick a couple of those, and could you explain to me what they mean, direct descent and co-orbital, for example?

**Victoria Samson**

Sure. Well, direct descent is, I think, what a lot of people think about when they hear about space weapons. It's something that's being launched from Earth to directly intercept or hit a satellite in orbit, so a missile launching from the ground going up to hit a satellite. Whereas co-orbital is more the idea that something is put in orbit and then manoeuvres once it's on orbit to hit its target. Then we have different options as well. There's directed energy, weapons that use focused energy such as lasers to interfere or destroy space systems. [inaudible 00:10:55] has Buck Rogers up here. Electronic warfare, where you have radio frequency interference, basically jamming. And then, of course, cyber. So there's a whole host of ways in which you can interfere with another person's, another entity's space capabilities.

**Michael Veitch**

Is the notion of that ... What was the movie where the aliens come and smash the place up, 20 years old, where they actually put a virus into an alien ship? Is it theoretically possible to infect a moving satellite with a virus to take it out of action?

**Victoria Samson**

Michael, I believe you're referring to 'Independence Day'.

**Michael Veitch**

Independent ... thank you very much.

**Victoria Samson**

Yes, right?

**Michael Veitch**

Indeed.

**Victoria Samson**

Yes, thank you.

**Michael Veitch**

I really like that film, too, in a silly kind of way.

**Victoria Samson**

The thing is cyber attacks are relatively easy to do, in that you don't necessarily have to get into orbit. You can have a cyber attack on a ground station. You can do some sort of cyber attack when you manipulate data as it's coming back down. You think about it, a lot of these, especially

the national security satellites, they're big and they're old. They've been up there for a while. Think about how often your computer goes through software updates. Now, once a satellite's up there, you really can't do that, and so it becomes a real challenge to be able to keep up with that. Now, thankfully, the most important satellites tend to be protected from that sort of thing. But you have a whole system where you're getting capabilities from other actors in the commercial sector, and at any point during the supply chain, you can have some sort of interference or some sort of cyber or malware or something like that put in. So it definitely is within the realm of possibility. The other thing is that it's easy to deny and it's hard to attribute. So it's seen as a very attractive option for people to attack other people's space capabilities.

### **Dr Cassandra Steer**

There's something that Victoria highlighted there that I think's really important to make clear, is that satellite systems or space systems are made up of three segments, so you have the satellite in space, you have a ground station, and then you have the link between them, so the communication between them. That means there's actually three points, three physical, although I guess the link between them isn't physical, but three points at which a space system could be vulnerable. So a cyber attack could be into the satellite itself or it could be the link between it, like interrupting the communication between the satellite and the ground station, or it could be the ground station itself which is targeted.

So when we talk about direct ascent weapons, they have been tested in quite contentious situations. They create an enormous amount of space debris, so they are actually the least desirable form of weapon because space debris is bad for everyone. You can't contain what happens with space debris, and it's going to impact your own satellites as well and cause a risk for your own satellites. So direct ascent is the least desirable from every party's perspective, and these other kind of soft kill attacks like jamming the signal, or spoofing a signal, or a cyber attack are much more desirable because they have less physical impact and you can be more targeted about what it is you're trying to interrupt for what purpose and where, and usually for how long as well. But it could be any one of those three segments.

### **Michael Veitch**

We're assured that only non-kinetic capabilities are being used presently. What's meant by that, and can it last?

### **Victoria Samson**

Well, non-kinetic is just basically what Cassandra just said, the idea that it's a cyber attack or it's some sort of jamming, something that essentially does not create an active debris on orbit. So the thing is everyone jams. Everyone jams. It is seen as an extremely usable way of interfering with other people's space capabilities. And so, the concern is, where is the red line? At what point does it escalate things, and it's really hard to say. There have been some discussions about this with the International Fora, but they haven't come to an agreement. The other thing is the idea that possibly lasing, using a laser against satellites to temporarily blind the satellites, that's pretty effective because all you need to do is shoot up a brief laser, it interferes with the satellite taking information from its optical lens, and then turn off the laser and you're done. The problem is the line between dazzling, as in temporarily interfering with the satellite's ability to collect data optically, and blinding, i.e. permanently creating that issue - it's hard to know and it's hard to figure out where you've crossed that line.

### **Michael Veitch**

Well, we're assuming that future conflicts won't involve vast armies moving on battlefields, so that notion of warfare is looking more and more sort of an antiquated one. However, our wars will look different and not necessarily being fought between nation states. Of course, we've been at war for a couple of decades now with a non-state organization, such as terrorism. Space would seem to be the ideal environment for terrorism. I'll ask both of you, the scenario of a terrorist

organization wanting to leverage what's known as the Kessler syndrome, to virtually take us back to the Dark Ages, by wiping out things like satellites and destroying communications and other essential services. This surely must be something that space defence is looking at, not just looking at what other countries are doing but what other even individuals are doing.

**Victoria Samson**

Yeah. Yeah, Cassandra, I'll let you go.

**Dr Cassandra Steer**

Well, I actually think it's a lesser threat, and if we are looking at terrorists or non-state actors being able to access this kind of technology, it's unlikely that it's going to be a terrorist group with access to an expensive and very complicated technology for a direct ascent weapon to target a specific satellite and blow it up and create space debris. If they did, again, non-state actors are dependent on space services as well. We all use it for our 21st century lives several times a day, possibly hundreds of times a day, and so it's not really in anyone's interest to create a really problematic space environment, physical space environment.

But I do think there's probably greater risks of non-state actors, insurgents, potentially terrorist groups wanting to interrupt ... And that's kind of the asymmetrical question, right? As a non-state actor or a terrorist group, you don't have to have access to an enormously well-armed artillery. What you do have to have access to is technology. And because the biggest militaries are the most dependent on technology, the most dependent on space-based technologies, if you do have the capacity to undertake a cyber attack, then you can have a greater impact than trying to blow something up. So that is a question in terms of definitely cyber space security, potentially some of those soft kill attacks as well. But I think the bigger issues, really, are the competition between the biggest states. We're going back to a multi-polar competition, and that's where I see the biggest tensions lying, although I don't know if Victoria agrees with me on that.

**Michael Veitch**

Well, indeed. I was going to add that the US, not surprisingly, has traditionally possessed the most advanced space situational awareness capabilities, but these are being challenged. Where are the challenges coming from, and is it like that era before the first World War, where you have nation states worrying about becoming the have-nots of military power? Are there space weaponry have-nots worried about their status, Victoria?

**Victoria Samson**

Yeah, I think there are some that are concerned that we could see some sort of replication of what happened with the Nuclear Non-Proliferation Treaty. For those of you who are fortunate enough not to be familiar with the NPT, basically, it was signed in 1970, and it created two sets of states, nuclear weapon states and non-nuclear weapon states. Essentially, if you had tested a nuclear weapon up to that point of that treaty being signed, then you were a nuclear weapon state, and if you were coming in after that, you were a non-nuclear weapon state. There are several states that have tested nuclear weapons afterwards that are considered pariahs, and they're like, "Hey, look, we didn't sign the NPT. It's not fair that we weren't included. If we had tested ahead of time, we would've been grandfathered in."

So there is concerns of some states that if there is some sort of agreement or some sort of legally-binding treaty or even just some sort of agreement not to test further kinetic energy ASAT tests, for example, anti-satellite tests, then they might be left behind or they might not get the prestige that they think you can get from having a space weapons program.

In my opinion, I think Cassandra really hit the nail on the head with that discussion about competition. It seems that now, to be a global power, it's not enough to have a space program, a civil space program. It's not enough to have your own space agency. It's not even enough to be able to launch your own satellites, which there's over 80 countries that have satellites but maybe

only about a dozen or so that can launch them. Now, it seems that this perception is growing. To be a really powerful global entity, you need to have space weapons program or counter-space capabilities, and that concerns me.

**Michael Veitch**

And to the regulation of that, Cassandra, you've spent a good time, a very good time, exploring and explaining space law. Let me speak to my old mate, the devil, for a moment by proposing are we not kidding ourselves in thinking that space can ever be anything but inherently and completely ungovernable?

**Dr Cassandra Steer**

I don't think so. It already is governed, and this is a point that I've raised in some of our previous discussions in other episodes, is that space already is governed and, to a certain extent, successfully. The Outer Space Treaty from 1967 is a framework treaty. It operates like a constitution. It has some core general principles. They are general in nature, but they're core principles which space actors have adhered to in the decades since we've been in space - which is that you can't appropriate space, there's no claim of sovereignty, that there shall be cooperation, there generally is cooperation, despite everything we're discussing today, that space should be used for peaceful purposes. Then you might question because we've also just said that space has always been used for military purposes and national security purposes. How can that possibly be peaceful purposes?

Well, very quickly, a consensus interpretation of that principle emerged, which is that you can use space for military purposes as long as those are not aggressive, so not against ... Article 2(4) of the UN Charter prohibits the use of force, and any use of force that isn't authorized by the Security Council, or isn't used in justified self-defence is prohibited and is considered to be aggression. We haven't seen anything like that in space. I think even with attention around counter-space capabilities and the need to be able to protect one's space systems ... I guess the parlance that we hear quite often is to deny access of your adversaries to your space assets. So even with that, we still haven't seen any aggression in space. I don't think we're likely to see aggression happen in space in the near future.

It is quite likely, as Victoria said, that if we have terrestrial warfare, which is already supported by space-based systems in a really integral sense, that that might extend into space. But that still doesn't mean that it's ungovernable. I remain rather optimistic in that. I think there's enormous tensions right now, and we need to clarify more things. We need to take more steps. But, for instance, the project that's been mentioned a few times in this podcast series already, the Woomera Manual, on the international law applicable to military space operations, that is an attempt to clarify how the rules around the use of force, the rules around the law of armed conflict and how they would apply in the space domain. Once we have more clarity on that, we have less risk of those miscalculations and those escalations that Victoria mentioned. But I think the biggest challenge is arms control. That is the most difficult thing to govern in space.

**Michael Veitch**

Well, the accumulation of counter-space capabilities surely constitutes a space arms race, does it not?

**Dr Cassandra Steer**

Yeah, I think...

**Victoria Samson**

Well...

**Dr Cassandra Steer**

... we're in a space arms race. Victoria, you seemed to pause on that, but I think we're in one.

**Victoria Samson**

Yeah. I agree that there's competition. I don't like the idea of a race because what's your end goal? When there was a race to the moon, that was pretty clear. What's your end goal? We want to get to the moon. But a space arms race, how do you know that you've won? I think we're going to keep seeing a spiral that's going up and up and up as tensions increase, but there's no definite end point. Actually, I take it back because I feel like recently, over the past year or so, there has been a race back to the moon. Everything comes back again. There are a lot of people in the US national security community who are very concerned about, let's be honest, Chinese intentions, and some of that, I think, is how we tend to view everything being done by others as signs to the United States. I do not share that perspective. I don't think necessarily other countries do everything as mean to signal to the United States...

**Michael Veitch**

That's the...

**Victoria Samson**

... and they have their own domestic interests.

**Michael Veitch**

That's the traditional prism, isn't it...

**Victoria Samson**

Right.

**Michael Veitch**

...by which many countries look through what they perceive to be adversaries in all sorts of theatres? To the UN trying to keep a lid on all this, 21, I believe, different UN guidelines - do these guidelines have to divide themselves up into military and commercial applications?

**Dr Cassandra Steer**

So those guidelines were adopted last year, the guidelines on long-term sustainability of outer space. Those guidelines are really about what is it to be a responsible actor in space. So there's no division between military and civilian or commercial in those guidelines. The guidelines are really stating things to do with making sure that there is a space debris mitigation plan.

When you launch something into space, what are you going to do at the end of its life? Are you going to de-orbit it? Are you going to save some fuel to de-orbit it? Are you going to move it into a so-called graveyard or unusable orbit?

Building that kind of thing into satellite design, taking care of things like the impact of space weather on satellites, because if you can do that, you can also reduce another piece of space debris because you can keep your satellite going for longer. And making sure that these kind of values are integrated into organizations that are active in space. So that goes whether you're a military or a commercial actor. Everything we're putting into space, we have to think about the long-term impact, particularly in light of what Victoria said, that we're going to have hundreds of thousands of satellites in a very short time.

**Michael Veitch**



But to put my devil's hat back on just briefly again, what's the point of these guidelines if they can't be legally binding or enforceable?

**Victoria Samson**

Well, let me jump in there.

**Michael Veitch**

Please.

**Victoria Samson**

I have a real bias towards these guidelines, largely because my boss was the chair of the working group that negotiated them. So we're big believers in the guidelines at Secure World Foundation. But I liked them before he became my boss. The thing is the long-term sustainability guidelines were agreed upon, as Cassandra said, last year at the United Nations Committee on Peaceful Uses of Outer Space, or COPUOS. The UN has divided up discussions of space issues and civil space, i.e. COPUOS, and then security space, the Conference on Disarmament and the General Assembly. So the guidelines themselves were agreed to by the 95 member states of COPUOS. That includes countries like the United States, Russia, China, Iran, Brazil, a wide variety of space actors, and they all agreed to these 21 guidelines, which that's encouraging.

Having said that, as you said, these guidelines are only good as they're being implemented, and I think it's more important to say, "how do you implement these guidelines". Really, whether or not it's a legally binding treaty or if it's just a resolution you sign onto at the United Nations, if you're not going to carry it out, it doesn't make any difference. So that's where the real discussion is taking place now. How do you get countries to carry out these guidelines? A lot of times, it's a matter of these countries having the domestic capability of being able to do it. There are a lot of new space actors that don't have that capability yet.

**Dr Cassandra Steer**

It's something that the Australian Space Agency is looking at right now. It's developing its roadmaps as to what kind of policies it should be putting in place, how it can support space industry, and, obviously, space industry does a lot to support military activities in space, so to support Australian Defence. In those roadmaps, the Space Agency is looking at, "well, how can we implement those guidelines? How can we demonstrate that we're being a responsible space actor", particularly given the fact that we're seen as a new entrant? We've been active in space for quite some time, but we're seen as a new entrant in the sense of upping our game and now having a Space Agency.

But I agree with Victoria. It's down to how states, countries implement that at a domestic level. The reason that there has been more of a push towards non-binding guidelines, rather than treaties, is because, as Victoria pointed out, all the countries she mentioned are in very tense relations with each other and it's really hard to get them around a negotiating table. And there have even been some proposals to put treaties in place preventing the placement of weapons in outer space or arms control treaties. There is just a very uneven political desire to enter into those kinds of treaties right now.

**Victoria Samson**

Cassandra brings up a very good point. The problem we run into is you can't solve a problem until you agree what the problem actually is you're trying to solve. When you have these discussions at the multilateral level in the United Nations, you have a split as to what the actual threat is to the security and safety of space. The US and its allies tend to look at it almost as an environmental cluttering, so many satellites, space traffic management, you're running out of space, it almost becomes an environmental issue, whereas Russia and China tend to look at it as

they see the biggest threat as actual weapons placed in space, and, let's be honest, space-based interceptors is part of a missile defence program.

So, it's been tough because when you try to have these discussions, they're coming at it from entirely different perspectives. That's why I think it's been helpful to get off this wagon wheel of are you a treaty or no treaty, where it's kind of a binary discussion about this, and talk more about, as Cassandra said, responsible behaviour. Whether or not that's treaty-based, or what have you, what do you think is actually going to make space more stable and predictable? I think that will be better for national security than anything else.

### **Michael Veitch**

And it is good to hear your delightful seven-year-old daughter fervently agreeing with you in the background, Victoria.

### **Victoria Samson**

She does so love space.

### **Michael Veitch**

You have taught her well, and don't worry, we are very family friendly here on *Conversations on the Runway*. I note many attempts of the United Nations over the years to build very complex and kind of nifty acronyms around peace in space. The Unity of the Institute for Disarmament Research has long been speaking of PAROS, Prevention of an Arms Race in Outer Space. But I do note that one of the first resolutions passed, I think, back in the early '80s was 'An Effective and Variable Agreement to Prevent Anti-Satellite Systems'. That was at the very beginning. That's not really working out too well, is it?

### **Dr Cassandra Steer**

It's not, but it comes down to what Victoria just said about the problem of defining what it is that you're talking about. As technology has moved and has advanced and counter-space capabilities look different than they might've done in the '80s, it's become even more difficult to define that. So the PAROS movement, I guess you could call it, the Prevention of an Arms Race in Outer Space, the General Assembly adopts annually pretty much the same resolution almost annually. In which they state that there is a desire to see a prevention of an arms race in outer space. The

General Assembly resolutions are not binding, of course, so what it is is a really important reiteration every year of the vast majority political opinion and concern about what's going on in space, and that has a value in and of itself. It's not a legal instrument, but it's a very important statement that comes out.

Then, under the PAROS, we've had a few different attempts. China and Russia have been putting forward a joint proposal a couple of times, in 2008, again in 2014, for a Treaty on the Prevention of Placement of Weapons in Outer Space, the PPWT. So, as Victoria said, their concern is very much about weapons in space. And there are others who are more concerned about if you can't define what a space weapon is, which is what a PPWT would require, because you can't always verify that what's being launched, that might be stated that it's being launched as a communications satellite that then gets repurposed or then spawns a smaller satellite which has a different purpose in space. It's very difficult to verify. It's very difficult to define.

The US has been pushing back against that consistently, stating that one of the biggest problems is verification but also making quite clear that they don't really want to enter into a treaty, a binding treaty on this matter. We've had other attempts. The UN has established a group of government experts, which met last year to discuss, "Well, what potential practical steps can be taken? Should we be talking about some kind of treaty or not? Should it be a PAROS treaty? Should it be a treaty talking about reducing arms that can be used in space, even if they're not

space-based?" Again, the US pushed back against that as well. They just seem to be very unwilling to enter into a binding agreement, and that's because ambiguity serves them well and serves many states well. Having a lack of clarity about exactly what is prohibited and exactly what is permitted is in their interest at the moment.

### **Victoria Samson**

I will say that, actually, just a couple of months ago, the United Kingdom released a resolution that they're doing at the United Nations, where they're basically asking all countries to submit a report to the Secretary General - what do they actually think is a threat to space security? That's an attempt to try and get us all on the same page, so I'll be very curious to see what comes out of that. It could be potential to be a log-jam breaker.

### **Michael Veitch**

You've written, Victoria, about the lack of progress on developing norms and behaviour in space. I suspect that's a polite way of agreeing with my premise that it's nearly ungovernable. But is one of the major problems what the UN describes as the, quote, "inherently opaque nature of space military activities?"

### **Victoria Samson**

Well, I think it's a matter of space is inherently dual use. It's not necessarily the technologies that are threatening, it's what you do with them. So the fact of the matter is, how do you demonstrate good intent? How do you demonstrate benign actions? Sometimes, you can do that by putting out a policy. Sometimes, you can do it by sharing space situational awareness, the idea you're sharing information of what's happening up in the domain. But other times, it's not very clear, and so that's why I think there's been a move towards identifying what these responsible behaviours are that I think can be very helpful. The interesting thing, for me, is that the commercial sector is almost leading the way. There have been at least three documents that have come out over the past year or so by consortiums of commercial actors saying, "This is what we think is considered responsible behaviour, and we will bind ourselves to this." You think, commercial actors are voluntarily taking on these restrictions on their behaviour, then it must be something that they're ready to sign onto. I feel like it's something that states could learn from.

### **Michael Veitch**

To return just quickly to what Cassandra was alluding to before, the blocking of the United States in some aspect, I note that China and Russia actually did submit a joint working paper on the preventing of the use of weapons in outer space. Firstly, why did they team up?

### **Dr Cassandra Steer**

China and Russia have a lot of shared interests, right? As two of the five permanent members of the Security Council, there's often alliances sought on certain issues because Security Council members have, of course, a right to veto on resolutions. So there's often political alliances sought around a lot of issues. China and Russia have a lot of shared interest in pushing to get back against, what's perceived as or I think could be understood as, very much a Western dominance on a lot of issues around international security, international peace. Who has certain rights in certain regions? And because, as Victoria said, they really are focused on the threat of weapons in space.

So, as I mentioned, that treaty hasn't gained a lot of support, but what it has sparked is a bigger discussion about, "do we want a treaty or not?" There've been other initiatives also that were, first of all, initiatives by China and Russia, which have been followed by some states, which is an encouragement for states to make a statement which is a unilaterally-binding statement.

Stating that they will never be the first country to place weapons in space. Because if every state promises that, well, then the idea is no one will be the first, so no one will do it.

**Michael Veitch**

That's a familiar clause in peace treaties going back hundreds of years, isn't it? "We won't be the first to pull the trigger."

**Dr Cassandra Steer**

Exactly right.

**Victoria Samson**

Yeah, the implication is that, of course, they will be happy to be the second. The US doesn't support no first use for nuclear weapons, and the US definitely does not support no first placement. I think that the idea is that it's being put up as a straw man to make the US look bad, to be honest.

**Michael Veitch**

Well, did the US actually put up a counter-proposal of their own, Victoria, to this joint China-Russia submission?

**Victoria Samson**

No, and that's been the frustrating thing as an outside observer watching these discussions, is that I think there's a lot of problems with the Russian and Chinese suggestion in the PPWT. But the United States has not done any kind of counter. The argument for years was that, well, there's no arms race in space, therefore, we don't need space arms control, therefore, we don't need the PPWT. And over the past couple years, there's been a growing acknowledgement that there is competition in space, but when they say, "Okay, what do you have to counter the PPWT?" (the Russian and Chinese proposal) the US has not had a lot to offer in return. You really can't fight something with nothing.

So I think these discussions at the International Fora of looking at what is considered to be responsible behaviour, I think that's an acknowledgement that the United States cannot have freedom of action for itself, but everyone else has to limit themselves.

I think it's recognition that space is so important to the US national security infrastructure that we need to figure out, okay, there need to be some boundaries for actions and we need to be able to sign onto them ourselves in order to make sure others abide by them, too.

**Dr Cassandra Steer**

It's interesting, too, in terms of now we have the US Space Force, so something that was debated for well over a decade and which finally gained traction under the current administration. Part of its justification has always been, well, there's sufficient threat by other players, in particular Russia and China, in terms of a threat to space systems, part of which includes space arms. So, on the one hand, there's been this rhetoric, "Well, it's not really an issue, we don't want a binding treating around it." On the other hand, there's been a justification, "Oh, but other players really are a threat to the US, that's why we need a Space Force." I see a little bit of cherry-picking in terms of the rhetoric, depending on what action or what institution the US wants to support.

The US isn't the only one that does cherry-picking, of course. But now that we have a Space Force and now that the States, the US, has made very explicit statements in its policy in its recent strategy released in July this year, other states, in particular China and Russia, read that as a direct threat. So when we see news items about Russia has once again recently tested a potential anti-satellite weapon and that's such a threat to the US and its allies, I think we also have to see it from the other perspective, which is the fact that there is Space Force, the fact that there's this

rhetoric, is raising the tension, is an escalatory thing in and of itself from the perspective of other states.

**Michael Veitch**

And, Victoria, since one of your eminent articles carries the delicious title, Make Space Great Again, noted, what is your take on what Cassandra's just said?

**Victoria Samson**

Oh, I agree with her. I think it's been interesting seeing how many other countries suddenly decided they wanted a Space Force when the US officially came out with our own Space Force. The Russians and Chinese did have sort of an equivalent Space Force, but over the past year or so, the Indians stood up something, the Japanese stood up something, the French stood up something. My organization actually had a conference, and we titled a panel session, Everyone Wants a Space Force, because it seems like everyone does. Again, I think it goes back to the idea that if you're really trying to make sure space is a national security enabler, then one way of ensuring that is establishing a military space organization, whether it's a Space Force, Space Corps, what have you.

**Michael Veitch**

I note that the EU has even got in on the act with their own International Code of Conduct for Outer Space Activities. Thank goodness there's no decent acronym for that one, I don't think, anyway. How effective do these non-big players have a role in determining what happens in terms of the tranquillity of space?

**Dr Cassandra Steer**

Well, unfortunately, the International Code of Conduct, which sadly is often referred to as the ICOC, that's...

**Michael Veitch**

There you go.

**Dr Cassandra Steer**

Yeah, so the ICOC was actually not seen as a successful document. The EU proposed this in 2008. They put it forward, really, because they wanted to talk about responsible behaviour in space and because there seems to be a bit of a preference for these non-binding instruments for all the reasons that we've mentioned. But there was a bit of a pushback on that, in particular, by the smaller states, not the big players but the ones who realize that they also have a vested interest in space. But they didn't hear their perspectives being taken into account. They thought the process was very EU and Western-focused. And so the EU rectified that with a series of open consultations, and in 2014, they put another draft of this International Code of Conduct, this ICOC, forward, and they asked the UN to host the meeting, during which they wanted to really talk about entering into negotiations, talk about the content of this document.

It just stalled completely on procedural matters, mostly because, again, the smaller states said, "This is not representing the whole world, this is not the province of all humankind, this is the province of a few small number of powerful states." And also because it got a little bit politicized around the issue of whether or not the right to self-defence would be reiterated in this document. Which is not even a necessary thing because that right to self-defence exists under international law. The EU attempted to get in on it, but unfortunately it stalled because of all of these political pushbacks. So I think that the takeaway from that really is that there is a desire to have more non-binding instruments, but it needs to be truly multilateral. We need to have that international collaboration if we want it to be successful.

**Michael Veitch**

I do also note Cassandra, that COPUOS, the Committee on the Peaceful Uses of Outer Space, which since 1958 has included a wide variety of some of the smaller players, and perhaps one of the smallest I can think of is Australia, but we have been a member of that organization since its inception in 1958.

**Dr Cassandra Steer**

Yeah, and a fairly active one. I think there's actually a really exciting role for Australia to take right now in what's happening in space, especially given the fact that our Space Agency is so new. Especially given the fact that there is more communication, although there needs to be more, between Defence and the Space Agency. We are in a really fantastic position. A lot of the world is watching Australia because of this mandate that the Space Agency has to support space industry. We're in a great position to be able to take a leadership role in terms of pushing for these norms, pushing for what is responsible behaviour in space, through COPUOS, through other UN bodies, through the General Assembly, and also just as an independent state that is now very much active in the space sector.

**Michael Veitch**

I imagine Australia's role in space, and I'm sure you can speak to this, Cassandra, will be more academic, industry-based, R&D, building relationships with perhaps our Pacific Island neighbours, that kind of thing.

**Dr Cassandra Steer**

There's definitely an important role for us in that sense, so capacity building, assisting our neighbours also in their ability to access space and benefit from space. But I'm not sure...

**Michael Veitch**

In what ways? Can you just speak to that for a moment?

**Dr Cassandra Steer**

Yeah, sure. So part of it is capacity building in the basic sense, in what this podcast series is doing, educating people about our dependency on space and why it's important that we all are aware of what's going on. And also capacity building on the R&D side, so being able to share technology and train people up so that they have the wherewithal to ... They don't necessarily need to be launching things into space, but if they're able to operate satellites, provide services, track satellites. Some of our Pacific neighbours are really well-placed to have ground stations that can be really important tracking stations.

But I think Australia's role goes beyond what you might call R&D or capacity building because we have a number of really fantastic companies that are really good at particular kinds of technology. Because we have been, for many years already, being able to service very remote areas with telecommunications, Earth observation that can assist in climate tracking, search and rescue, again, in remote situations. Space situational awareness as well, the ability to track what's in space. We have a lot of commercial entities who are really good at that. And Defence has annual events, SpaceFest, where it puts out calls and says, "We want to see what industry is doing and see how we might be able to acquire and use some of that technology," because being aware of what's going on in space is extremely important. So space situational awareness is a key area of space operations currently but also in the coming decades, and that's an area that Australia really could be a world leader.

**Michael Veitch**

I'm so glad you brought us back to the original premise of today's *Conversations on the Runway*, utilizing the word corporation, not just necessarily conflict. We're nearly out of time, but I want

to go to both of you. Optimistic or pessimistic for the notion of conflict in space going into the future?

**Victoria Samson**

I'll just say I'm cautiously optimistic. I feel that things are becoming very tangible with the launch of all the mega-constellations, with the use of space for national security issues, for how space has been intertwined in our daily lives. And so I think just given how important it is in the international community, I think eventually we'll come together and find a way to make sure that everyone continues to get the benefits from use of space over the long term.

**Michael Veitch**

Cassandra?

**Dr Cassandra Steer**

Yeah, I agree. I think the title of this particular episode has to do with cooperation in space, and we've talked a little more about competition. But space diplomacy is an important thing, and it happens a lot. It's not just at COPUOS, it's also between states themselves. I think it's really heartening that commercial actors are starting to take their own initiatives in terms of what is responsible behaviour, as Victoria has pointed out, and I think there's starting to be more of a public interest in space. People in general are starting to realize how important space is, and that's going to make a difference because if you have a popular support for these issues being put on the table, then space diplomacy can actually take us further.

**Michael Veitch**

Who knows when our children and grandchildren ... Some of whom, children, have been on the show today, which is wonderful. We're very family friendly here, as I said, on *Conversations on the Runway*. I want to thank our two wonderful guests. Beaming in directly from the United States, Victoria Samson, the Washington Office Director for the Secure World Foundation. Thank you so much for your time, Victoria. And also our regular ... She's becoming a regular guest and very welcome too, Dr Cassandra Steer. Thank you very much.

**Victoria Samson**

My pleasure. Thank you for having me.

**Dr Cassandra Steer**

Thanks so much.