Transcript of ‘Connecting the Arctic and Outer Space’

Season 3, Episode 5, Transforming Tomorrow

[Theme music]

Paul: Hello and welcome to Transforming Tomorrow from the Pentland Centre for Sustainability in Business. I'm Paul Turner.

Jan: And I'm Professor Jan Bebbington.

How is space infrastructure impacting Indigenous life in the Arctic? Why is Donald Trump trying to buy Greenland? How have satellites impacted our night skies? And what does all this mean for sustainability?

Let's go to the Arctic Circle.

[Theme music]

Paul: What's the furthest north you've ever been in the world, Jan?

Jan: Ah. Probably, um, uh, Kiruna, which is in the north of Sweden, just inside the Arctic Circle.

Paul: Ah, that is north…

Jan: …it was fantastic…

Paul: …properly far north. What were you doing there, or are you not allowed to talk about it?

Jan: Ah, no, no, I was, um, [laughs] I was, uh, working in Sweden and we decided to take the train up. So the train trip was long and it was January, but somehow it was, it was luminescent because of all the, the snow.

And then what, I don't know, because I've also been on the northern coast of Iceland, which might be further north than that, but I'm not entirely certain. I don't think it is further north than that.

Paul: No, I've been to Iceland, but I've not been to the north. I've been to the bit that everyone goes to…

Jan: …ah, yeah, yeah…

Paul: …round about Reykjavik, and then inland a bit from there too, where the geysers are…

Jan: …yeah…

Paul: …and things like that. Geysers, in this case, referring…

Jan: …the old geezers… [laughs]

Paul: …to spouts of water coming from the ground, yeah, rather than very old people. Uh, I'm sure they have old people there, but that's not the reason we went to visit.

Now it's interesting, isn't it, that on the, this planet, when you go so, so far north, civilisation in lots of ways disappears, especially if you get to the very extremes of the North Pole and the South Pole.

Jan: Well, I suppose it depends what you mean by civilisation, 'cause people have lived there forever and are really well adapted to living there. So yeah, certainly, um, there are smaller communities, but really important communities, nevertheless.

Paul: No, no, I really do mean the North and South pole. The only commun, the only civilisations you've got at the South Pole are penguins and at the very, very North Pole there might be the odd polar bear that's got a bit too far north.

But yeah, people don't live there because essentially it's too cold. But then you come down into the edges of the Arctic circle, you do have…

Jan: …yeah… way, way north.

Paul: Yeah, way, way north. But that's not to say there's nothing there as you say…

Jan: …indeed...

Paul: …there's lots of things there. And that brings us to what we're gonna talk about today.

Jan: Oh, polar bears…

Paul: …exactly. [Jan laughs]

We've got a whole episode coming up about penguins and polar bears, and who would win in a fight between a thousand penguins and one polar bear.

Jan: Mm-hmm. Aha, I don't know where to wager on that one.

Paul: Yeah, I mean the penguins have the numbers, but they don't have the claws do they? I mean, there's only so much a peck from a penguin beak's gonna do.

Jan: Yeah, but I've watched Madagascar, so I know four penguins are very dangerous. So imagine what a thousand of them would be like.

Paul: Alright. But maybe it's like, that's the perfect number…

Jan: …are you sure…

Paul: …you go beyond four, they're no longer dangerous…

Jan: …are you sure this is a podcast topic or have we… get on track, get on track!

Paul: Well, you're the one who took us off track by suggesting we were gonna have a podcast on polar bears.

No, I want to talk to you about the links between the Arctic Circle and the people that live within it and space and sustainability.

Jan: That's brilliant. 'Cause we've been to space before, but we've never been to space via the Arctic Circle. So how does that work?

Paul: I don't think we've been to the Arctic Circle ever, have we? This is our first trip to the Arctic Circle. We've left that, we've already been to Mars and outer space, and the Sun. But now we're going to go, yes, we're gonna go there.

Well, what we're gonna do today is we're gonna speak to Dr. Mia Bennett and she is, and this is in quote marks, 'a political geographer with geospatial skills'.

Jan: [whispering] I love it.

Paul: [whispering] I dunno what that means.

Jan: [whispering] I do. It's fantastic.

Paul: [whispering, but getting louder] Good. Right. Don't, don't tell her I don't know what that means.

Jan: [whispering, but louder] Carry on, carry on.

Paul: And she's from the University of Washington. Um, she researches the Arctic and orbital space and that touches on everything from Indigenous People to satellites…

Jan: That's brilliant.

Paul: It is. Welcome Mia.

Mia: Thanks, Paul. Thanks so much for having me.

Paul: To throw you a curve ball, are you at all and expert on polar bears?

Mia: Not at all. I did see my first polar bear this year though, so I do feel I'm a little bit more legitimate as an Arctic researcher now, so that was very exciting for me.

Jan: Hopefully it was a polar bear, a long way off.

Mia: It was a safe distance, about a kilometre, which is, yeah, I think the limit for how close you can get in, in Svalbard where we were.

So, but yeah. Exciting and safe.

Jan: Well, that sounds amazing.

So how come you get to do this? So can you tell us about yourself and your background?

Mia: So, uh, I'm an Associate Professor at the University of Washington in Seattle, and I've been researching the Arctic for 15 odd years now.

So I started my research as an undergraduate at the University of California in Los Angeles, which is a very sunny place from which to study somewhere so far north.

But ever since I was a teenager, um, I've just been interested in, in Scandinavia and Nordic cultures and Arctic environments. Um, partly to do with my family heritage. So, I went to Sweden to study Swedish language one summer, and that led to an internship at the US Embassy in Oslo the following year.

So that was 2008 and things were really starting to kick off in the Arctic that year. You had the US Geological Survey announced a massive oil and gas deposits in the Arctic. The year before Russia had carried out this kind of very, uh, let's say sensational flag planting on the sea floor underneath the North Pole.

So there are a lot of geopolitical and kind of economic interests suddenly coming together in the Arctic, at a time of accelerated climate change and increased public recognition of that, of the ongoing crisis.

So all of that kind of came to a head, and when I got back to the University in the autumn, I just decided to kind of start burying myself in Arctic research and it's kind of kept, I've kind of kept pursuing it to this day.

Jan: [deadpan] You could say it snowballed.

Mia: [laughing] So yeah, that'd be a good way to put it.

[Jan laughs at her own joke]

Paul: [mock frustration] Is this the level of discussion I can look forward to?

Jan: [recovering from laughter] Sorry, I'll get myself, I'll get myself back on track. I'm terribly sorry. Carry on Paul.

Paul: Yeah. Yeah. We'll, we'll ignore that and uh, carry on.

So, how then do you come to be interested, Mia, in the connections between space and the Arctic? 'Cause it wouldn't necessarily to me be an obvious connection until I've learned more about your research and your work.

Mia: That's a very fair point. And I guess to kind of explain my interest in the intersection between these two so-called frontiers, we'd have to go even farther back to, to when I was a little kid, I dreamed of being an astronaut.

And that never transpired. I wasn't good enough at maths and physics and things like that in school, so I decided, well the, the kind of furthest point I can still get from society to reach these kind of remote places on planet Earth would be the Arctic or Antarctica.

So I became a polar researcher instead, but still really hold this kind of deep interest in space. And increasingly in the past few years, I have noticed these frontiers coming together through the lines of infrastructure.

So for instance, you have both, on the one hand, a history, Cold War military infrastructure being built that was surveilling the skies for missiles and bombers. And then now, um, which we can talk about a bit more, there's space ports that are being built in the north.

So I'm really seeing a kind of a fusion of the Arctic and space that I think is ripe for kind of, uh, critical engagement, let's say.

Jan: And how far back does that link between space and the people of the Arctic go?

Mia: That's a good question. So, um, I recently wrote a book with another political geographer, Klaus Dodds, and in the research for my book, I was trying to think about, you know, how can we situate the connection between the Arctic and space in a way that really does justice to the Indigenous Peoples who've inhabited the Arctic for tens of thousands of years and also turned to the skies for just as long.

Um, so in the course of our research, I came across kind of lots of studies that show how Indigenous Peoples have navigated by the stars, by the constellations. They were able to tell the turning of the seasons even in the depth of the polar night, when it's just dark for weeks and weeks on end, because they would notice the constellations changing in the skies, and that would signal the emergence of spring.

There's also an interesting case of the Cape York meteorites, which were these iron-rich meteors that came down in Greenland thousands of years ago, and those were basically chiselled away at by the Inuit people and turned into knives and tools and traded all across, um, the North American Arctic.

So there's both material and kind of more, let's say, abstract ways in which people in North have turned to space and used its resources as well.

Paul: When we come then, further forward, more recent times, let's say about the last a hundred years, was the Cold War then an important period for the Arctic when it comes to space?

Mia: I would say so. Um, certainly during the Cold War, you had in many ways militaries, both in the west, so NATO militaries, and then you had Soviet Union, both looking at the enemy across the North Pole.

To do that militaries, were using radar technology, so they're kind of scanning over the horizon for signs of incoming threats, whether that would be a missile or a intercon, an intercontinental ballistic missile or a bomber plane, what have you. So there was kind of already this, this turning upwards into kind of the atmosphere, at least we could say.

But eventually through the, throughout the Cold War, various militaries also begin kind of surveilling space. Um, space is not weaponised. So the Outer Space Treaty prevents putting weapons into space. But we could still say that

space is seen as a realm that militaries want to defend and, and try to maintain a degree of access to.

And VR tech provides, um, a very useful point for surveilling, um, space from the north. So that's, for instance, why, one reason why we could say the US, um, decided to build a military base in the far north of Greenland at Thule, which is called Qaanaaq by the Inuit people, um, because it just offers a very strategic vantage point, both to look towards what was then the Soviet Union and to look north up and up into space.

Paul: I think Jan, I'd given you good money when we did the first episode of this podcast a couple of years ago that we'd have two episodes that mentioned the Outer Space Treaty.

Jan: Yeah…

Paul: …well, there we are, 'cause we've already talked about it in the context of asteroid mining and how that..

Jan: …yeah…

Paul: ...is affected by the Outer Space Treaty, but it, it's now affecting us down here. And, uh, weapons we're looking at now. This is fascinating.

Jan: The other thing that it brings to mind is that, um, looking at the history of fishing globally, um, Iceland's always been in a really particular position. And again, during the Cold War, had a really, uh, good sort of trade regime with the US who would put tariffs on everyone else, but never on Iceland.

'Cause Iceland said, oh, yeah, well, you can tariff us if you want. We'll sell the fish to the USSR, and they said, no, no, no, no to the tariffs, we'll have your fish.

So, so that sort of whole sense of those northern latitudes being a point of contestation with people who are, you know, on either side of them, not necessarily right in them, when it comes to the US, but with a really strong interest in them.

Paul: And in a lot of context it makes sense why it's the North Pole and not the South Pole in this regard…

Jan: …yeah…

Paul: …'cause if you look at geographically countries that are near the South Pole, there are none. There's Antarctica and a big ocean all around it before you get to any kind of countries.

But you do have penguins in New Zealand and South Africa.

Jan: [laughing] You do, indeed. I was going to say, I felt sure we were gonna be back on the penguins.

Penguins are quite territorial, so it's probably best not to try put a space port on the South Pole.

Paul: Yeah. Is it, the main army in New Zealand is actually penguins…?

Jan: … steady, steady. You're in trouble. You're on, the ice is cracking…

Paul: …thin ice...?

Jan: …thin ice… [laughs]

Paul: …yes, yes…

Jan: …anyway, back to the question. So when, um, this is, this is fascinating stuff, um, Mia.

So what, what impact, um, has that kind of contestation and that building of the surveillance infrastructure had on the land and the people who live there?

Mia: You know, the impacts in many ways have been very detrimental.

So if we go back to this example of Thule Air Force Base, which was built, I want to say in the early 1950s. Um, so basically during the Second World War, the US agreed to defend Greenland because Denmark was unable to do so.

Um, so on the one hand, you could say, okay, Denmark, the Kingdom of Denmark, benefited from the US coming in and building surveillance structures and sending it military there, but the people who are already living in Greenland lost out in many ways.

So there was a small community of hunters, um, in Qaanaaq, but they were basically forced to leave their homes. And not only were they forced out and made to resettle, um, I'm not sure the distance, but some ways away from, you know, their normal, what they would, what they would've called their homes.

Their homes were also burnt to the ground and they were not allowed to return. Um, the homes were burnt to basically discourage the hunters from

even coming through on, on trips to go hunting. So not only were they, could, they couldn't live there, they couldn't hunt there as well.

So that's just a very, I think, extreme example of the ways in which militarisation has completely, um, undermined and pushed aside Indigenous Peoples.

You also have, let's say, longer term ecological devastation that has happened as a result of radioactive waste just being dumped into Arctic seas, or even buried in the Greenland ice sheet, that I suppose militaries thought would stay locked away forever.

But climate changes. Perhaps causing some of this to seem a little bit riskier. Um, there is radioactive waste in the Greenland ice sheet, but so far it, it continues to sink deeper and deeper due to accumulating snow. So it's not actually at risk in the near term of melting out, but it's still a big worry for many people.

Um, and then you have, as I mentioned, this radioactive waste in the Arctic seas north of Russia, and that problem could worsen, which would impact fisheries, um, people, both Indigenous and non-Indigenous who rely on, on that for, um, on that food source.

Uh, that problem stands to worsen as a result of a lack of cooperation now between Russia and the West as a, as a result of the full scale invasion of Ukraine.

So we're just seeing a lot of, um, kind of further disruption. Which is, let's say a long running consequence of this early on militarisation of the Arctic, that has really, I think, done a huge disservice to Indigenous Peoples who've used the land and resources in many other ways for millennia.

Paul: You've tied it in there with something that's going on at the minute, which is the invasion of the Ukraine by Russia, but also, you've got one man who's mentioned Greenland more in the last 12 months than it had possibly been mentioned across the rest of the world for about a decade, and that's the US President Donald Trump.

His obsession with Greenland, the Vice President, JD Vance, visiting with his wife, and lots of sounds being made essentially saying, Greenland should be ours, we want Greenland, Denmark, get out, we want it. And lots of political issues that have arisen because of that.

Does that all tie back to everything that went on in the Cold War and the building of this base, do you feel? Or is it more tied in even further back with the position of the Arctic and where Greenland is and the potential there for, as you say, monitoring and all the space work that might, we come in to soon.

Mia: So on the one hand in, in my research, I do always try to historicise a lot of the kind of, let's say, media sensationalism that the Arctic kind of is often presented through.

So Trump's desires to annex Greenland, purchase Greenland, what have you, which were, which he first kind of put on Twitter back in 2019 during the first Trump administration.

There is a longer history to the US um, wanting control of this very strategic island since, uh, around 1867 or so, which was when the US purchased Alaska from Russia. So there is this, uh, kind of interest in the US continuing its territorial expansion, its pursuit of manifest destiny into these farther, um, northern reaches.

And with Greenland, Trump used this phrase, um, we need Greenland and we need the Panama Canal, I think it was as well, for hemispheric security. So it's this idea that the homeland, as it were, of the United States, the kind of, let's say the lower 48 states, can only be secured if we have a wide perimeter that would include Alaska, Greenland, Panama, central America, what have you. And you know, then you have to ask where does it stop?

So there is that history of the US kind of wanting to buttress itself. Um, but then you also have to couch that within Trump's just completely kind of asinine way of viewing everything in politics as very transactional. Viewing everything as a kind of real estate deal, and him effectively thinking if he just makes an offer that Denmark can't refuse, then Greenland will be his.

Um, I don't think there's a lot of logic behind his impulse, you know, how would the US incorporate Greenland into, I don't know, American society when the US has already treated other places like Puerto Rico so poorly. It's just, it's a very harebrained scheme, but there is a longer history to it, we could say.

Paul: [mock serious] I would never have the words Donald Trump and harebrained scheme mentioned in the same sentence. [Jan laughs] That's terrible.

Jan: But that now also makes a lot more sense about Canada as well. 'Cause if, if you've got Alaska and you want Greenland, then Canada… would be handy as well.

Paul: Yes.

Jan: Thank you. That, that I've, I'm, I mean, harebrained, I've just sort of, it's a bit harebrained, but with that historic placing of it, that makes so much more sense now.

So, so thank you for that. And I'm sure our listeners will also go, ah, now I see.

Paul: And, do you know what? It's something I knew, but I forget that I knew. I forget that Greenland's an island. If you, you know what, it's so easy to forget because you look at atlases and stuff, it's like joined up by all the ice, but that's ice that could melt away.

And with climate change and such being as it is, it could melt away in the not too distant future. And it could be more obvious now, but yeah, you forget that Greenland's an island.

Jan: So that's helped us understand that connection between, sort of like, uh, you know, frontiers, two frontiers, um, infrastructure, defence and whatnot.

What is it when it comes to Arctic, which re with, um, respect to space and to satellites, how does that joining up happen?

Mia: So, in the past, let's say 20 years or so, there's been a real explosion in the number of satellites that are being slotted into orbit. Many of those are Earth observation satellites.

So, these are satellites that are effectively taking pictures of Earth, whether that's optical images that resemble how a human would see the planet, or there's other satellites that, you know, capture infrared wavelengths or microwaves, or what have you.

So there's more and more interest in carrying out earth observation for science, for surveillance, um, for commercial purposes as well. And then in the past, let's say since 2019, there's been an even more rapid growth in telecommunication satellites, specifically internet satellites. Um, so you, then those are mostly, let's say, we should, we should be up front about this, operated by Elon Musk and his Starlink company. So there's lots of satellites going to space.

Now, the ones that are doing Earth observation, they want to capture imagery of the whole planet, and to do that generally those satellites orbit around the North and South Pole because that allows them then to cover, um, every longitude as well over the course of anywhere from a few days to a few weeks.

So the idea for, let's say, putting these satellites into a polar orbit is then, well, how do you get the data downlink from those satellites and brought back to the user on Earth? And how do you do so in a rapid fashion? Because data is only as useful as it is timely.

So what we're seeing happening is ground stations, as they're called, these are kind of big arrays of antennas. If you've seen the movie Contact, you might be familiar with these big dishes. When they're built in very harsh environments like the Arctic, they're covered in these, what are called radomes, so big white spheres that look even more sci-fi.

Um, but basically a number of ground stations have been built in the Arctic and even in Antarctica to enable just rapid downlinking. And the world's largest civilian ground station is actually in Svalbard, which is a Norwegian island, halfway between the Norwegian mainland and the North Pole.

So, if you to were to visit there, um, today, you would just see hundreds of these radomes, silently downlinking data from the polar orbiting satellites overhead, and the odd reindeer scurrying around the radomes.

So it's really a very surreal site that I've had the fortune of visiting. Um, and you can just imagine, you know, all these kind of little radomes are listening to satellites in the skies overhead. So it's very kind of, you know, you really feel the frontiers connecting when you're there.

Paul: And for the people then who live in the Arctic, the Indigenous People who've been there for hundreds, thousands of years, how has space changed for them, then?

It sounds like there's lots of things have changed on the ground with things such as the satellite bases you're talking about, and the missile sites that we talked about, and the radiation, unfortunately, in the ground that we talked about. But what about space itself? Has that changed for the people of the Arctic?

Mia: Hmmm. Well, I would say I think the biggest change that I've heard kind of brought to attention by Indigenous Peoples is the fact that when these

satellites, more and more satellites, are streaking across the night skies ,that makes reading the skies and navigating by the stars or kind of, let's say, telling ancient myths and what's called star lore much harder to do. Because you just have these satellites getting in the way.

I don't know if either of you have gone out into a dark sky and now notice instead of seeing shooting stars, almost all the time you're just seeing these satellites kind of blinker across, across the skies, which is, you know, unfortunate for people who appreciate astronomy, but perhaps even worse for people who are using the skies in a more instrumental way to, to get around effectively.

Otherwise, I don't know if there's been so many specific changes to space itself beyond this light pollution problem. But that is a very severe one that Indigenous Peoples are increasingly, um, underscoring and raising as an issue in forums such as the United Nations and elsewhere.

Paul: So what about on the ground, then? Have all of these structures that have been built and the work that's been gone on to sort of help explore space, to help with the satellite bases, all of this. Has that damaged Indigenous cultures at all? Have they been affected by it on the ground?

Mia: Hmm. That's an interesting question because I would say, on the whole, the arrival of militaries, of, of these southern states, you know, colonisation, imperialism has had absolutely devastating impacts on Arctic Indigenous Peoples.

In many ways their cultures and language have been damaged, but I don't want to say irreparably because I think it does a disservice to Indigenous Peoples, to paint them entirely as victims. Um, in the past half century, 60 years or so, we've seen a lot of amazing, um, very successful efforts by Indigenous Peoples across the Arctic to organise, to take back power.

Um, we've seen successful land claims in places like Alaska and Canada. In places like Russia, Indigenous Peoples are in a much, um, worse position vis-a-vis the state. But still, there are efforts increasingly by Russian and Arctic Indigenous Peoples in exile to fight for their rights and to have a voice.

Um, so that being said, though, there is still a lot of damage that we can see that has been, um, carried out by the militaries in, let's say the past century.

Because they are building this infrastructure. They are, as we discussed, kind of building sites in Greenland or in Russia.

You have the Plesetsk Cosmodrome, which I'm, I'm not sure if how it would've directly impacted any Indigenous Peoples around there, but surely even local people who live there, they've been, you know, perhaps suffering from the, the debris that comes down from rocket launches and so on, which oftentimes has very toxic fuel tied up with it.

There was a really interesting article though by The New York Times, which showed how people living nearby this cosmodrome in Russia, um, where they would place both intercontinental ballistic missiles and launch satellites, um, have made use of this space junk and turned it into kind of works of art in their front yards.

So I think that one example highlights how, in many cases, people living in the Arctic have a complicated relationship with militarisation and colonisation, um, and the forces that come in.

Um, because if we look to Alaska, for instance, you had this so-called distant early warning line, which was built by the US government, a series of radar stations stretching from Alaska across Canada all the way into Greenland, built during the 1950s.

And oftentimes Indigenous Peoples were employed to work on these sites and to construct them. It was not forced labour, they were paid wages. And I've spoken to members of some families who say those wages helped them kind of just, you know, accumulate some savings and then continue, let's say, um, dogsledding or other traditional practices.

So Indigenous Peoples adapt. Um, some of them maybe, let's say, do well in terms of earning a kind of steady employment in these military sites. Other times the impacts can be much worse. So it's a very, um, kind of varied picture, I guess, of impacts, that I think will really depend based on who you talk to and also where in the Arctic you are, right?

If you go to the Nordic countries today, where there's a real push to militarise the north, again because of, uh, Sweden and Finland joining NATO in the past couple of years, um, there, when you talk to Sámi people, at least one, um, Sámi individual I spoke to said that he doesn't, he thinks the military, um, this

was in Northern Finland, is doing a decent job of consulting with Sámi, warning them of when they're going to do exercises, things like that.

But it's the actual infrastructure, when it's built, that is a big problem because then that just remains in place for, for decades, right? And the Sámi, let's say, do not always have proper consultation then.

So that's maybe more of a sticking point, is the actual buildup, this growing footprint now, instead of just people and forces coming in and going. Um, so there's a lot of kind of, I guess, complexities to this whole, um, this whole process we're seeing play out once again.

And, and hopefully the mil militaries will be more respectful in the ongoing buildup, um, than during the Cold War, but I don't think there's many guarantees of that, at the same time.

Jan: What's really fascinating about what you described is, is there's sort of like three players.

There's like the military players and, and the militarisation has a particular dynamic and a particular, you know, ebb and flow to it. And it might be, you know, getting bigger at the moment.

Then there's state action where states might have, you know, interests and, and either interact well or poorly with their Indigenous people.

But then there's commercial organisations as well, and businesses who are operating sometimes as subcontractors to the military, but sometimes on their own accord as well.

So that strikes me as, from a governance perspective, a really complicated landscape, 'cause it's not the same rules for all three users of, of that space.

So as a, if you're living up there as, as you know, somebody who lives in a place, um, you know, have lived there for a long time, have traditional rights, et cetera. Then how you interact with each one of those players will be very different.

And, and some of it will be, well, you take what you take, and other ones will be a bit more give and take from it. So that must also make responding to what's happening in your own backyard really difficult as well.

Mia: Absolutely. You raised a lot of good points there. I mean, uh, one example I heard is, uh, Greenland has, let's say 57,000 people. And at one point, I don't

know, I think it was Shell or some major oil company was considering doing, uh, you know, exploratory drilling offshore, but Shell has more employees than all of Greenland, right?

So, you know, it's one thing for these small countries to deal with huge nations like the US or Russia, but they also, at the same time, as you point out, have to contend with major transnational corporations and, you know, have these small, do these small countries have the human capital to really do that?

It's, it's a big question and a big challenge, um, for a lot of people living in the North.

Paul: There's a lot there of political, social, economic impacts of what's going on up there. But what about environmental? Is the space infrastructure that's being built in, uh, the Arctic having an impact on the environment?

Mia: So I would say that there are a lot of environmental issues coming from the development of space infrastructure in the North. Um, one example is from Andøya Spaceport in north Norway. So on the one hand, I do think the operator, Space Norway, is trying to take a lot of precautions, especially with regard to making sure to protect the fisheries.

That fishermen there have expressed concerns over. Let's say if a rocket launch goes awry, if it was using hydrazine, which is a very carcinogenic fuel, perhaps it could, um, irreparably damage the fisheries there. So that's one example of a potential environmental hazard from space infrastructure and Arctic.

Another example that has actually happened is in, on, at the Pacific Spaceport Complex in Kodiak, Alaska. There have been a number of tests launches that have not gone so well, let's say, and ABL, which was a commercial company that's now since been renamed, um, from California. I think one of their rockets, uh, basically had some sort of explosion, which resulted in all the soil being contaminated.

So there weren't any, there's no Indigenous people living on that specific site, so it didn't have those kind of direct impacts on a community. But still the soil was, um, you know, full of toxins to a level that the State of Alaska cannot treat.

So all of that, so it has to be barged out and brought down to the State of Washington, you know, a thousand miles away. So a lot of these issues in the Arctic are very hard to treat in the region, um, because it is so remote and it

doesn't always have the same environmental, um, disaster response capacities as we might down in, in the south. So that's just another challenge of how to respond to emergencies, disasters, um, ecological or whatnot in nature in the Arctic.

Paul: You've talked a lot about a lot of commercial companies and it, it must strike a lot of people as being unusual or unexpected that there's so many commercial companies operating up there.

And you've talked as well about companies who are launching rockets from the attic. Is that becoming a more common thing, that we might previously have associated rocket launches with governments and with countries, nation states. You've got sites in America, you've got Houston, you've got Florida, for instance, and you've got the various sites in places like Kazakhstan and Russia.

Is it now becoming more common to have sites up in the Arctic Circle that are potentially launching rockets?

Mia: I think the key word there is potential, right? So on the one hand, we definitely have a lot more commercial actors that are involved in space. So that is, kind of, all falls under this umbrella of what's called 'New Space'.

So, the first Space Age was characterised by national governments competing in space for access and influence. Since the 1990s or so, a lot of states, um, such as the US and countries in Europe, not so much Russia and China, uh, but the West has encouraged, um, commercialisation in space to basically enhance competition and, and state-of-the-art technology.

So that has allowed companies like SpaceX, run by Elon Musk, to really become the dominant players even, um, in, in the US. So I think SpaceX launched something like over 90% of, um spacecraft in the US last year to get into, to get into orbit.

In the Arctic, though, I think a number of the space ports that are being built, whether in Sweden, Norway, um, in the subarctic, in the UK, in Shetland you have a spaceport underway. And then this one I mentioned in Alaska that's actually existed since the late nineties.

Whether the commercial companies will actually turn up, uh, is something that remains to be seen. So, the Alaska spaceport, they've pretty much only had the US military and its allies such as Israel come and test launches, which have all been suborbital, so not actually going into space.

Um, I think in Sweden and Norway, there is a bigger chance that commercial companies will, uh, really participate in, in using those spaceports because the only alternative in Europe is to go all the way across the Atlantic to French Guiana.

Whereas in the US you have, as you mentioned, the space sports in Florida or California, which are much closer to these aerospace manufacturing bases in places like Los Angeles and Denver.

So I think the European Arctic has a better proposition, um, to commercial space companies in Europe for, for actually using their sites.

Paul: Well, I think then we're coming towards the end, so I just want to wrap up then Mia, by asking you what do you think is gonna come next?

What do you think will be the next step with what's gonna happen in the Arctic that ties in with space?

Mia: Oh gosh. I've never been a person who likes to make, uh, future predictions [Jan laughs] but, uh, I could try.

Well, uh, maybe I'll just kind of, uh, cap things off by recounting a conversation I had with, uh, a young scholar at a conference recently on ethnographies of outer space, which was held in, in Vienna by the very cool Futurespace project, uh, run by Nina Klimburg-Witjes.

So she's a professor who's working on, kind of, science and technology studies of outer space. And there's more and more people doing anthropology of space, ethnographies of space. But then there was this person I met who didn't present, but she actually said, she grew up on Svalbard, which is already very remarkable because it's a community of only 2,000 people.

And one of her parents worked, um, in this ground station up in Longyearbyen, the big hub on Svalbard. And she said that overall, you know, her family, her, her father, found very gainful employment in the site. And now she was studying to be an engineer and her kind of university group, I think she was a student at University of Trondheim in, down in the Norwegian [inaudible], had engineered a CubeSat, so a very small satellite, that they hope will be on board the first rocket launch from Andøya, which is, or they've already had one, it didn't go very well.

But if they have a successful one, hopefully in a few months, and she says that their CubeSat might be on board. So I thought that was a really neat example

of how space is becoming more democratised. Even though we hear a lot about, you know, increasing potential for weaponisation, militarisation and space, more people like university students are able to engineer things, um, with very small, miniature kind of technologies. And find space on board a rocket to get it into space.

So I would like to see that as kind of, you know, a positive way to view how space could be a place for, you know, all people to kind of carve out some little niche and find a way to use it in a way that's like fun or interesting or, um, helpful for humanity.

That could be one trajectory. Um, I don't know if that is a guaranteed trajectory because as we've talked about, we're in a very fraught moment where, you know, we mentioned the Outer Space Treaty, which was signed in 1967 during the Cold War at a time of great international animosity.

But I feel the appetite now is even less for, um, kind of creating rules of the road that would govern space. That is, space that is getting increasingly crowded, increasingly clogged by satellites. I don't see the US Russia, China, let alone other countries all coming together and saying, hey, let's figure this out together.

So that does make me nervous for the sustainable and equitable use of space and, and then in turn how that will impinge upon communities on Earth, in the Arctic and elsewhere, where a lot of this infrastructure is materialising.

So I have a lot of, a lot of concerns as well, but there are some glimmers of hope.

Paul: Well, Mia, you've taken us on a great journey today. Thank you so much for joining us.

Jan: Thank you.

Mia: Thanks, Paul. Thanks, Jan. It was a lot of fun to talk with you both.

[Theme music]

Paul: I've always liked space, and I've always liked the Arctic and I've never really tied them together, but today has shown me how many potential connections and how many actual connections there are between the two.

Jan: And what I liked, uh, about what Mia talked about is, it's like geopolitical and geospatial.

And so that, um. Yeah, it was. It was riveting. Absolutely riveting.

Paul: There's so many aspects to it when you consider, especially this commercial element that's coming in and the potential for what might happen in future years, both positive and potentially negative. When you're looking at the political side of it between all the countries that are involved in have an interest in the Arctic, when you're looking at the social side and the Indigenous cultures. It's so, so complicated. It's all interweaved.

Jan: And whenever you hear of, you know, something taking off and crashing, you know, your first thought is you hope, well, there's no one on board when that happens.

But sort of thinking about the, you know, the failed launches and what they physically, you know, do in terms of toxic waste, et cetera. That's something that was, I hadn't, um, come across it all.

But I did notice that New Zealand is currently consulting on rewriting its rules about how much, um, launch debris can end up in the ocean.

Paul: Is this like you've got rules about how many mouse hairs are allowed in so many grams of chocolate? [Jan laughs]

There's gonna be a rule about how many, how many space debris elements can be found in a square kilometre of water.

Jan: Yeah. Well, of course, you know, there's lots of other things in the ocean. You don't wanna be dropping stuff on, on, you know, rigs or other activities. You don't want to be dropping it on fishing boats, et cetera…

Paul: …mm-hmm…

Jan: …so, so I think that that sort of, that use of space and who gets, like space as an area, not space as in space, is really, really important.

Paul: Yeah, I mean, I, I attended a session that Mia did earlier in the year, and she showed the examples of Alaska, and some of the work that's gone on there. And talking about how the fact they'd had some test launches that never actually made it into anything greater than that, and the, the damage that had been done, even by them, to a certain extent, by some of the debris that was scattered off by failed launches and the like, it's all these things that you have to consider.

When you're going back that bit further, and you consider about the radiation that's seeping through the snow and into the permafrost, and everything that's under there in Greenland, and that's from 50, 60, 70 years ago…

Jan: …yeah…

Paul: …and that's just still there. All from this exploitation of the Arctic and everything that's going on there.

Jan: And this reminded me of when I was, um, I was in this trip to Iceland that I was talking about was, was unfortunately not a tourist trip. I, I'd love to go back as a tourist.

But it was going to, um, the, the second largest university in, um, Iceland, which I, I, I think it's called Akureyri, if I'm saying it right, it's right on the north coast. And there was somebody there who was working quite far north in Canada. And then there was some folks from far north in, in, um, Sweden as well.

And I became aware that there is a University of the Arctic Circle, which is the universities that are, you know, close to or in the Arctic Circle, have this relationship with each other. Whereby the kind of research agendas and the concerns and the issues that are raised for them are very particular.

Um, kind of like, um, the earlier episode we had about, uh, sustainable mountain development, you know, the, the issues for people living in the Arctic are very particular.

And there's this consortium of universities that work together to create this University of the Arctic Circle to deal with those issues, which is a really great way of universities coming together to understand things of common concern.

Paul: And as we've pointed out in this episode, so much of it ties in with current geopolitics, whether that be the US and their interest in Greenland, whether that be the Russian invasion of Ukraine and the effects that has elsewhere in the world.

There's so much that always needs to be considered when it comes to the Arctic, and when it comes to space.

Jan: Yeah. But then at the end of the day, the justice on the ground. And I think that's the other thing that was really, um, well-articulated by Mia, is that people live there.

It's, it's their place, it's their, it's their, where they tell the stories about the stars, et cetera. So that justice angle is very largely put together as well.

Paul: And as she also pointed out, it's not necessarily all bad for those people…

Jan: …yeah…

Paul: …you've got that person who was working, or whose father rather, was working in Svalbard on one of the installations there. And the benefits that brought to him, to his personal life and to the economy there.

There's always gonna be things that weigh off against each other.

Jan: Yeah. And I really liked the way she resisted saying, you know, Indigenous people aren't always victims. We don't need to think about, you know, you know, a whole group of people in that way.

So I think she articulated that very well without necessarily forgetting that there can be also negative impacts.

Paul: …mm-hmm…

Jan: …so, no, I enjoyed that immensely.

Paul: So did I. So what are we gonna be speaking about next week, Jan?

Jan: Well, let's stick with some justice things.

Paul: Justice…

Jan: …yeah…

Paul: …is that it, are you bringing more justice to the world?

Jan: More justice to the world.

[Paul and Jan laugh]

Paul: Should we talk about justice and just transitions?

Jan: Yes, please.

Paul: Yes. Let's welcome back Camilo Cornejo Martínez, who's been with us before, and he's gonna be talking about various different court cases and legal rulings that are going on all around the world at the minute, and how this all ties in with climate conflict and just transition.

It'll be an interesting topic to discuss.

Jan: And a really nice link on to what we've just been talking about as well.

Paul: It will, it will be. Well until then, thank you very much for listening. I'm Paul Turner.

Jan: And I'm Professor Jan Bebbington.

[Theme music]