Episode #211 Beyond the Solar System Angelo Vermeulen

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Susan: Well today I am delighted to welcome Angelo Vermeulen to Life Beyond the Numbers. Angelo, you're so welcome.

Angelo: I'm glad to be here. Thanks for having me.

Susan: And first of all, I want to thank Jay Perry who introduced us, and I had Jay on the podcast a couple of episodes ago. I'll leave a link in the show notes and he put us in touch saying You two should meet and here we are.

Angelo: Yes, exactly. Yeah. I've been working with Jay for a very long time. He's been, coaching me for more than a decade now. Yeah.

Susan: Wow. That's great. I only met him recently. I met him through my sister and it's always brilliant. I think when other people say you two connect and, and I love that about life as well, connecting people that don't know each other. So let's see where this goes.

Now I've done over 200 podcast episodes. And I always research the person I'm [00:01:00] going to speak to. 'cause I like to get a flavor for who's coming in front of me and. As I was looking at your profile, which is one of the most extraordinary profiles I've ever looked at, I had this like feeling of, I've done nothing in my life. And of course that's not true, but Angelo.

Let's go to multi potentiality first because I think you personify that and I know I haven't given anything away, but how do you introduce yourself?

Angelo: I can introduce myself pretty briefly actually. I can be like, listen, I'm a scientist and I'm also a visual artist, and I love to build crossovers between those two worlds. That's basically my most simple introduction, which is actually what I do. But of course then when you dive deeper into the details of what I do, it gets a little more complicated.

I'm a space biologist, [00:02:00] a complex systems engineer, and a visual artist. I've always been interested in art, science, technology and since I was a kid, since I was very young, and I've never left that path of trying to explore things simultaneously. and gradually I started

discovering how to infuse one domain with the other. And I think that's how I developed my whole life now. creating different directions in my professional life where, yeah, there is a main focus, but it's really influenced by the other things that I'm doing. so I'm involved, deeply involved in space exploration and in the future of space exploration.

But then, for example, as an artist That challenge of imagining our future in our space is very often a theme in my art. It's not the only topic that I explore in my art, but it very often is, is part of it. And that's just one example of, how I [00:03:00] built these crossovers.

Susan: And. Say that came from when you were very young. Because I think for many of us, it's almost an either or. We choose the science, not the art. In my case, we choose the accountancy and not the creativity. There's often a choice that we make that seems to take us away perhaps from that, that fed us at some point.

Ha. Were you always conscious of that overlap,

Angelo: Do wh which overlap?

Susan: like that, that, that not to let go of the creative side, the artistic side, because you became a scientist, so that's the, the avenue you pursued out of school, I'm guessing.

Angelo: Yes, yes, yes. But I think I wanna go back to what you just said, and you've, you're using creativity as something that is typical for the arts. As if it would [00:04:00] not be typical for any other profession. And that's really, I really disagree with that. I think it's a, it's a common mistake. but I think in order to be really deeply connected to any profession you do, you need creativity.

So for me, it's not about artist creativity. I mean, you're not creative. You're gonna be, you know, something else. No, no, no. That's, that's just not the right way to look at it. I think, the arts has its own agenda, its own sensitivity of looking at the world, and not everybody is interested in that. That's perfectly fine, but I believe that actually most people have an innate, diversified set of interests. And it's strictly through society and through education that this gets hammered into a singular profession and a singular choice. it is understandable where this comes from. it's not like I don't get it.

I do get it. For example, it's often. Parents that are very concerned [00:05:00] that if their kids are all over the place doing all kinds of things, they won't get good in anything. They won't excel in anything, and it'll be impossible to build a career. 'cause they'll, they'll just be mediocre at anything.

and for example, in a bit more. traditional family settings, such, what I encountered, when I was traveling in India, for example, where parents have very specific expectations about

their kids and they all hope that their kids will become either a lawyer or a doctor or an engineer.

This is a big dream. Of a lot of Indian parents. that idea of developing those multiple interests is very hard to grasp for that generation. And when I gave talks there and then the young generation, after the talk came over to me, they were really like, I want to do something similar like you.

But I don't know how to even start with this because this is not what I'm allowed to do. So how do you even do that? of course, I come from a different culture. I'm European, and my parents actually have always stimulated all these different interests.

So I was lucky that I, I [00:06:00] could do that. Now I do have a reply to people that are. Concerned that their kids will be like mediocre at multiple things instead of just choosing one thing. And that is that if you develop yourself along a few lines and you try to go deep in each direction, the combination of those different

Perspectives will make you unique. That will make you stand out. It's another way to stand out, so don't worry too much. There are multiple ways to stand out and multiple ways to find your way in life. And this is just one of them. And like I said, I think that actually most people have this diversity of interests, but along the way this just starts to, it disappears.

Interests become hobbies. I don't consider myself as having a hobby. You know, everything I do is part of my professional practice. so that's just a different way of, looking at it.

Susan: And I [00:07:00] suppose in a way it was what I was trying to get outta that as well, because I went down that road of not forsaking it, but not knowing there could be both. And

Angelo: Mm-hmm.

Susan: think so. And now since I re found or rediscovered, that's the word perhaps, that there is this creativity inside of me that I believe we all have, that we're all innately creative.

It's changed how I live my life utterly and I'm still discovering that and. Sometimes it's really like, now my desire is to go too much the other way. But I think what you're saying is so interesting. It's that infusion or that, combination of different perspectives that brings out that uniqueness and,

Angelo: Exactly. Yeah.

Susan: and when you talk about multi potentiality or trans discipline, [00:08:00] I'm guessing that's what you're getting at as well.

Angelo: Yeah, I consider myself a transdisciplinary explorer researcher. it doesn't mean that I do not believe there is something like disciplines and there is no value in naming disciplines and, identifying yourself with a particular discipline. it's more about. On top of that, binary or hard separation between disciplines.

There is this other way of thinking, and I, I love to bounce back between the two. Sometimes I'm in an extremely transdisciplinary mode where I engage the world using all these, all these sensitivities and all this knowledge simultaneously, where I can simultaneously do a more analytical, scientific analysis, but at the same time a more meta-analysis from a more philosophical or artistic perspective, and you just bring it all together and you're just tackling something from that.

from that really wide range of skills and insights. and sometimes [00:09:00] I dive into details that are typical for a particular field. For example, one of the things that I work on is the design of bio regenerative life support systems for space. These are like artificial ecosystems for space that keep humans alive.

and then I dive into the chemistry of such ecosystems and I'm writing and talking about carbohydrates and lipids and calories and specific processes that are happening in the human body. And it's all super specific. and, and, and that's what I really enjoy sometimes going really deep into a particular topic and then on at other moments, just really transcending that and combining those perspectives.

Susan: Space. I can remember as a kid, my dad always had a quote and it, I can't remember whose it was, but Carl, say again. That's it. Someday there will be martians. The martians will be us. And that's [00:10:00] what I was reminded of reading about some of the work you are doing that, you know, we have Elon Musk exploring space and whoever, by virtue of building big rockets and so on.

But the work you are doing is more about can we survive outside of this ecosystem that we call earth?

Angelo: Exactly. Yeah. I would say that I'm using a bit of a, a holistic perspective on,thinking about the future of mankind, of humankind. Not just about the actual technology that is needed to get us out there and keep us safe. I mean, that's part of it, but it's much more, we're actually building culture in space and we've been doing that for quite some time.

the first moment we sent a technological object in space, in the fifties. That's where space culture started. Right. And so I think it's a lens through which you can look at our future, beyond Earth. It's this cultural lens, and that includes science and [00:11:00] technology, but so much more. And I have a few particular interests when I'm reflecting on the future of humankind out there.

one of them is the role of biology. Bringing terrestrial ecology into deep space to create systems that are extremely sustainable, that recycle human waste, all human waste, and turn all those waste materials, those molecules back into food and oxygen and fresh water using bio-inspired engineering.

For more resilient space systems, not just the top down design of a particular spacecraft, but actually spacecraft that can reconfigure themselves that behave almost like a living organism. so that's another domain that I'm working on. and something else that I find very fascinating is the idea of.

The multi-generational systems in space where generations of people are born in space. and, that's [00:12:00] inevitable. It'll happen. Might take a while still, but at a certain point that's gonna happen. And in order to explore that challenge, I have a role as the, CTO of a small space company, based in the Netherlands, which is called Space Born United.

And we are specifically working on developing technology to enable human reproduction in space. We're a medical company. We are working in the field of IVF and we are building the first IVF incubator to be sent in orbit around Earth to create embryos in order for us to be able to study early development of embryos in space.

We're still at the stage we're using mice and mice cells.

so it's early stages, but we are actually already addressing that challenge. So as you can see, I was always interested in space, but I'm also a biologist and I've been infusing my interest in space with that biological sensitivity. And that's how, these projects came about.

Susan: And. I suppose what strikes me is how [00:13:00] certain you seem that we will have people being born in space, that there will be future generations of like migration from the Earth, and what makes you so certain of that? Angelo?

Angelo: Yeah, To me, it's an extrapolation of human history and it's, like I said, inevitable that will end up there. That's the perspective that I hold. the idea is really that, I mean, when we started moving out of Africa, the early humans, our species. If you would've told humans back then that eventually we would end up in the North Pole developing an entire culture there.

Those people would've said, you're mad. That doesn't make any sense at all. there's no trees. Come on. Look, look around here. You know, in Africa, the beauty here, and all the trees and the Savannah and everything, and then the North Pole, are you kidding me? What are you gonna do there? So that seemed [00:14:00] completely impossible.

And still, that's what happens with humans. they will survive. They will figure it out. And I think space is just, the next stage. And the thing is it's already happening. It's not like, oh, will we go to space and will we live in space? There is already an international space station, which is permanently inhabited.

There is a Chinese space station, which is, is in full development, but there are multiple new commercial space stations that are in, in development right now. So in a number of years, in about a decade, we'll have multiple stations circling earth permanently with people living and working there. Going to space will become a job. this is not science fiction.

This is gonna happen over the next 10 years and not just the first stage. I don't know when we will end up on, on Mars, for example. I think we still need quite a few breakthroughs in, in terms of transportation, technology and also medical technology, but it's gonna happen now. The thing is, I'm actually, my interest is beyond that.

Beyond [00:15:00] the solar system. of course I have this interest in Mars, but what I'm really interested in is the post planetary condition of humankind. That is the condition where we are living, not just on the surface of a sphere like Earth or the moon, or even Mars. But we're living in different configurations throughout the solar system and beyond.

some populations will live in large scale space stations or large scale, spaceships that are traveling to other stars. And it's The collection of all those populations and all those cultures spread out through space that'll constitute, humanity. And that's something that I'm already kind of trying to reflect on.

So it's really a next stage of, human space exploration.

Susan: Have you been

Angelo: I, I wish, I wish I've actually, I applied for the, European Space Agency, astronaut selection a couple of years ago. And I made it to the final, 6%, which I was [00:16:00] actually quite happy about. I was really on the edge of the age requirements, so the chances were very low that I would, that I would make it.

But nevertheless, it was a very interesting experience and I've been an analog astronaut for nasa, which means that I've been. Participating in space missions on Earth, simulating missions in space. That's something that I did, but up to this moment, I haven't been to space. But honestly, I would love to go and I still hope that in my lifetime I can actually make it to space.

Susan: Yes, definitely. And it sounds like you will, I mean it does. Yeah. With your predictions. It really does. And, culture, so that's a word you've used a lot and, reading in

some of your work. It's also about bringing the indigenous culture. like using ancient wisdom and ancient learnings to inform the future.

If I got that right.

Angelo: Yeah, that's an interesting, challenge. It's how we will shape [00:17:00] that future in space. And we actually, with my Arts collective, which is called Seeds, space Ecologies, arts and Design, it's an art science collective that was founded a, a number of years ago. We actually, set up an arts project, that specifically addresses that challenge.

Like how do we. Imagine that future and what underlying paradigms are we using to build these images about our future of, of humankind and space? the project is called Engines of Eternity. and one of the questions that we're addressing in that project is if you look at the representation of our future in space.

You very often find a sort of utopian image, a sort of perfected society. It's as if space is the ultimate place where we can start from scratch or learn from the lessons, of history, and finally [00:18:00] reconfigure human society leaving out all the mistakes that we ever made, and finally find, the Utopian perfected society.

it's a very dominant idea that this is how, it will,

Susan: Space is the answer to

Angelo: Yes. Sort of. Yes. Yes. And it's also, it's like, A canvas on which we project a lot of our desires and hopes. But then I think the reality is very different. honestly, I think if we go to space, we will bring along humans nature in all its aspects, both good and bad.

we cannot escape ourselves and starting from scratch does not exist. You can't start from scratch. Every individual brings their own personal history, but also their cultural history. So the traumas from Earth will be part of life. In space. There is no escape.

So I think it's a much more interesting approach to actually accept that there will be [00:19:00] moments where we will struggle that human nature is complicated, is layered, has opposites, and then build around that instead of. embracing that very naive, very modernist idea that will find the perfected universal truth in our space and in terms of building, society.

So that's, that's one thing that I find very interesting. The other thing is that, what is typical for that idea that will find that ultimate society and spaces? it's like the answer is very singular. There is only one perfect solution. To find the perfect society. But that's also, that's a, that's a particular ideology.

Maybe that doesn't exist, maybe there are multiple really good solutions, and that brings us to diversity and also the problem that. A lot of the world's population is actually not participating in imagining that future in aerospace. the cultures that are actively engaged in aerospace are right now, of course, it's the United States.

It's [00:20:00] China and a, and a couple of other countries, but it's relatively limited. So the idea of bringing the richness of cultures of Earth into space and allowing each of them to find their own way and to find their own expression in space, I think is, is gonna be very crucial. And that's of course how you end up with indigenous perspectives that are, that have a very particular connection with the cosmos often.

and, and also, inviting those perspectives to be part of the conversation.

Susan: And as you're talking, I'm, I'm thinking about language, what becomes the language of space and, will it start new languages? Because if you took people from random parts of the world and placed them on a planet, how would they communicate?

Angelo: Yes. Yes. I think, of course in the beginning there'll be a, a few dominant languages. I mean, historically we, we have English and, and Russian. Chinese is gonna be another one that's gonna be, become a more [00:21:00] universal language in space. That's what I'm expecting. So I think those three languages will remain quite dominant in, in, in space.

But you're pointing at something which is, evolution, cultural evolution. And that's also a really interesting thing to think about. there are a number of aspects here. There is something called biophilia where the idea that humans innately are attracted to nature, that it's like encoded in our genetic makeup almost.

even when we see the color green, it has a psychological impact. It makes us more peaceful. It has this direct physical impact. Now I'm very interested and it's not like an experiment I could set up, but I would be very interested to see if people that are born on the moon. And that are never exposed to terrestrial ecology.

They never see forests or, the beautiful ecosystems of Earth. And then once they grow up, you'll bring them to [00:22:00] earth. Like I said, it's a hypothetical experiment. So thought experiment, when you bring them to earth, will they just immediately be impacted by this and immediately feel attracted to all these green ecosystems.

Or will they not necessarily feel anything like that? And will they start longing for the different views of gray that they're used to on the moon? And will that be their connection and their kind of, we don't know. And that's gonna be very interesting to see if we really need.

Ecology and living organisms as we know them on earth and the landscape has escapes as we know them on earth because it's deeply embedded in who we are, will definitely have to bring that along, not just to survive, not just to produce food and oxygen, but also psychologically and culturally.

If on the other hand, it's something that can be rewired that offers all kinds of new opportunities. And people will, of course, develop complete different sensitivities. [00:23:00] But like I said, at this point, we don't know.

Another one that I always like to talk about is, is food. during my work for NASA actually studied, food for future astronauts.

and what they would eat during a long stay on Mars. And it made me think that, you know, in the future, we'll probably not just order, Chinese food or Mexican food, but also Martian food. and this, this is not farfetched. If you have a culture that develops itself on Mars.

With particular resources, and a particular cultural sensitivity that over time develops, they will start developing their own meals and before you know it, it'll have its own identity and it'll come back to earth. So these are the things that I really love to, love to think about.

Susan: And, and food is cultural as well. It is so tied into culture, isn't it? And it's funny because as you said, Martian food, what I was thinking was earth food because will the Martians want the earth food as well? which brings me to [00:24:00] imagination, Angelo, because you've used that word quite a lot as we've been speaking and one of my previous guests talked about how she thinks imagination is one of our most underused resources as humans. Now, probably not for you, but for a lot of us, perhaps there's so much more to explore by using your imagination and let's just say the corporate world. It's not all the corporate world because we've had some amazing things out, but often you're being paid to think in a very specific way and not beyond the solar system thinking, almost like you mentioned. So do you see that when you bring this stuff to people, do you see limits of imagination or expansion?

Angelo: It's, it's a very interesting, this is a very interesting question, a very interesting topic. Mm, I [00:25:00] immediately have to think of the, very famous TED Talk, by Ken Robinson School's kill creativity. Where he states that the educational system teaches kids out of creativity. That's kind of the opposite

than what you would expect. That kids are super creative and they will just come up with something. But that, because of social pressure and a fear of failure and embarrassment that is being instilled because of the constant evaluation of your ideas to conform that gradually over time, people are building all these internal barriers to make, these very creative, out of the box statements.

And honestly, I sensed those limits myself. It's not like I'm free from that. and also during the, the work that I'm doing now, I mean, the career that I've built now, I had moments where I had to, take a next step to just cross another barrier and [00:26:00] confidently. bring my vision into the world or communicate my vision, into the world.

while before I would still be hesitating and it's an ongoing process. I'm very much inspired by science fiction. and that is definitely something that helps me, to think further. For example, I think

it's in science fiction literature that you find the most advanced and far reaching ideas. I love science fiction TV series and science fiction movies, but they're more limited, than what people can conjure up in, written form. So, for example, during my own trajectory, I, I, I moved from originally engaging with the world of space exploration as an artist because that's actually how my career in space started.

I was invited to collaborate with a, a very particular research program at European Space Agency, which is called Melissa. And this program is actually designing. a particular concept for an artificial ecosystem in AER [00:27:00] space, and I was invited as a more like an external collaborator to help them rethink the design of the system.

And very quickly, I, I picked up ideas from. from this research project, and I, I transformed it into a number of art projects reflecting on the future of humankind and space. and I was like, actually, I want to contribute to space. I, it's not enough to just be an external observer and then make these artistic reflections on it, which I liked, but I wanted more.

And that's how I kickstarted my career in, in, in space basically. and so my beginnings were really in space ecology, basically. That's where I started, but then I made a move to Interstellar Human Exploration, which is a huge step, right? the original,domain is quite realistic.

It's bringing a. Terrestrial organisms to space to create food, to grow crops and et cetera, to recycle CO2 into oxygen. this is feasible and has already been done on very small scale, but then making the leap to [00:28:00] human interstellar exploration, even in a multi-generational setup where people are born on board of spaceships, that's a massive jump.

And I, so I researched this for a number of years, which is my current PhD at Deloft University of Technology. But in the beginning, I remember I was actually a little uncomfortable to come out with that. It was more almost like private research I was performing. I was giving talks and I was giving talks about space.

But I only briefly touched upon these ideas about interstellar exploration, out of fear of, being chastised or not being taken seriously. And then I remember at a certain point, during

that research trajectory, I got invited, to give a talk, about my interstellar research at a conference in California, an interstellar conference in California.

and then I was like, okay, I'm ready. I'm ready to summarize my thoughts and to go on stage and to talk, and this was my breakthrough talk, a [00:29:00] 45 minute talk in which I presented the whole set of ideas that I had been working on over the past couple of years. And then I moved on and I never looked back, but I needed to make that transition.

It's not like you can just do it straight away. you feel intimidated. There is no way around. And I think that's what most people feel when, they engage with their imagination about certain things, about the future, for example. yeah. There is this inhibition and it's all about how can you remove those obstacles?

How can you remove that inhibition?

Susan: thank you for sharing that. I find it really fascinating because I think many of us talk ourselves outta things or step away from it and get sidetracked. And there's also something, perhaps what you brought in there was. You were ready to share. Had you not got that invitation to share though it may have taken many more years to be ready to share.

So there's also something [00:30:00] about saying yes, when an opportunity does arise.

Angelo: Exactly. Yeah. Yeah. that's of course,A sort of confidence that you need to build that when certain meetings happen with certain people, that you just trust your gut feeling that this is an interesting new direction in life. I mean, I try to be strategic, of course, about my projects and my work.

but at the same time, serendipity is a key component of my entire existence and I I really love that. I mean, the fact that I got invited by European Space Agency to start working with them, which like I said, kickstarted my career in space was because I was giving a talk with one of the researchers in Brussels, and he was also giving a talk.

it's Professor Max and that's how he discovered my work. We started talking and before I knew it, I was connected with his research group. If I did not give that talk. I have no [00:31:00] idea how my life would've looked like now. So it's, yeah, it's just this intuition like, okay, it's an interesting meeting, an interesting conversation.

There's something here. Let's see what unfolds. You know?

Susan: And that speaks a little bit as well to from imagination to collective intelligence. And that's something I am fascinated by that I suppose this the whole is greater than the sum of

the parts, and yet our tendency is often to work in parts. So there's so many projects that you've been part of, but collective intelligence is something you talk about too.

So maybe there's an example you can share with us where that really shone through.

Angelo: Yeah. And I also need to contextualize a little bit where, where this comes from, of course. I need to go back to the seeds art science collective that I talked about before. And I think our core methodology in creation is basically embracing [00:32:00] in a pretty radical way, co-creation. the concept of co-creation has been hollowed out over the years, also has been assimilated in a corporate context and sometimes not always used, I think in the most interesting way.

but the way, the way we see it is that in co-creation, true co-creation, you basically invite people to step into other domains than the ones in which they're professionally, versed, and that they're allowed to contribute to that other domain and that their contributions are taken seriously. And that their contributions are also being used because of course you can invite people to join new domains that they're not used to, just to give an outsider perspective, but have, then the perspectives are just remaining on post-Its on the wall and nothing is done with them.

Well, what's the point? but actually integrating and allowing those ideas and taking [00:33:00] those perspectives seriously. That is true co-creation. I've seen many fake co-creation efforts where either, the expectation of the person that is joining a particular domain or joining a particular project, it's too much predefined.

And it's like, yeah, of course you contribute, but that's not co-creation. You just contributed and you follow the script that was already there. Not sure if that's the full power of co-creation and other moments, like what I said before, where, ideas are gathered and collected, but they're never properly used.

So anyway, we've been exploring this and we've not just explored co-creation, but we've real in itself, but we already really embedded in a. Context of diversity, maximizing diversity, co-creation becomes even more powerful if you have a group with a high level of diversity.

And this can be on many multiple levels, age, [00:34:00] culture, disciplines, backgrounds, so all of that, you mix that and then the potential For innovation, for totally new ideas, for weird ideas is getting so much bigger because, people step into a field not having all the typical, baggage of a particular field will look at it with fresh eyes and bring something to the table, but then something else is joining with an even different perspective.

Before you know it, you get this combination of perspectives and ideas and troubleshooting, and it just creates a particular energy that is so stimulating that it helps people to remove

those internal boundaries that prohibit that limit imagination that I talked about before. it brings about a sort of confidence, within the group.

But I must stress that this is not something that necessarily happens automatically. I believe, and I've experienced that this really often requires facilitation. and that's a lot of tricky [00:35:00] thing because of the facilitator of a co-creation process becomes too much of a director. Once again, we're not talking about true co-creation, but if the facilitation is not properly done and everything goes, the whole dynamic of the group falls apart because nobody has any idea where things are going and people just are like, whatever.

this is not going anywhere. And finding that sweet spot is really the, yeah. That's really a daily challenge for anybody facilitating this. I've been facilitating many of these processes. I usually do it with at least one co-lead. I rarely lead projects just by myself.

It happens, of course. And interestingly enough, it's because of that extensive experience of working with these diverse communities,embracing this radical co-creation methodology that I was invited, to become. The crew commander of a NASA Mars simulation in Hawaii a number of years ago. So it's basically the arts that kind of impacted my, scientific [00:36:00] career.

Susan: Which is, it's lovely. It's a full circle moment as well. And I watched your TED talk, how to go to space without going to space, about that NASA mission. And I think one of the things that struck me most was. How it became about leadership as well, Angelo, what you learned about leadership. It wasn't simply how do we survive and feed ourselves and so on for this time, and maybe you'd speak to that a little bit.

Angelo: Yes. So just to, describe for the listener a little bit what High Seas was all about. So the name of the project is, is High Seas. It was a series of space simulation missions, in which we practiced living on Mars. I was, selected to be part of the very first High Seas mission back in 2013.

they were organized in a habitat on the flank of the Man Loa Volcano in Hawaii, a [00:37:00] landscape that looks very similar to Mars. And I lived with five other colleagues isolated in a relatively small space. a dome with a diameter of about 12 meters, and we lived. isolated and locked up in that dome for 120 days.

We could go outside, but only in spacesuits, mock-up spacesuits. So a number of time during the week, we had a couple of times where we actually, ventured outside. but apart from that, we basically were just, living with a small group, with a small group of people in a very limited space with, Big workload, something that is typical for astronauts in space. There's a lot of research that needs to be done. It's not like you're bored. I mean, your days are full. and so it's mostly this particular analog mission because that's how they call it. They call it an analog space mission.

Just like you can be an analog astronaut, which is what I am. And the goal of this particular analog mission was mostly to study the impact of [00:38:00] long-term isolation on both individual psychology and also on group dynamics.

And so, as I said before, I was invited to become the commander of this mission, which honestly, I never expected.

also because I'm Belgian, I was like, it's a NASA mission, you know, probably, they'll select an American for that. So I was very, very surprised when I got the phone call. but afterwards, the PIs, the principal investigators of the mission, they told me that. It was because of my extensive experience of working with complex communities all over the world that they were like, maybe you should take the lead here.

Now the thing is, when up to that moment. I, of course, like I said, I engaged in co-creation. I facilitated these processes as an artist. I considered those communities as cohart. but I always shied away from the concept or the words leadership. 'cause it, it just had too many, corporate connotations and I didn't wanna address it as an artist.

I was like, I, I don't wanna [00:39:00] go there. but then again. That's what I was working with. That's what I was experimenting with, of course. And so when I got selected to be a commander for nasa, I was like, maybe I need to be a bit more conscious about, what it means to be a leader and what kind of philosophy I'm embracing instead of just wigging it in an artistic way.

This is not gonna fly here. so, and that's actually when I started thinking more deeply about my role as a leader. And it became a huge learning curve. and so the importance of facilitating leadership. Rotating leadership, became very important. and I grew as a person and I've been different ever since and I still give talks about it worldwide, about those experiences and how they could be useful for other people.

Susan: the terminology is very interesting as well, because you were the commander, which makes it sound like the dictator versus a leader, which of course, as you've said, there's many ways to fulfill or embody that word

Angelo: Mm-hmm.

Susan: and. [00:40:00] So what expectations though, did the others have of you?

Angelo: Yeah. Good question. the fact that it, that the position was called Commander, of course, is this, this military tradition of space exploration. I mean, that's just the reason for it Now. The thing is in space, you won't be a traditional military commander because you are not working with soldiers.

I mean, I'm, not to, say anything negative about soldiers, but it's, it's a different type of people, let's put it this way. Astronauts, not soldiers, obviously. they're highly trained usually in many different fields. And they actually know what needs to be done. It's not like you need to shout orders in the morning.

Everybody knows what needs to be done, and you are not more accomplished than them. you're all pretty properly developed. otherwise you wouldn't get selected for these kind of missions. So you need a different kind of approach. And I think the facilitating leadership and is also something that I learned, from a, Belgian astronaut Frank De.[00:41:00]

Who was the first European commander of the International Space Station. I know him personally. And he also talked about when he got that position, how we embraced this leadership. And I was really inspired by that. And he was like, you know, my main role is to, facilitate the crew.

Facilitate their productivity, remove obstacles. That's my main role. And I kind of embrace that same philosophy, like, okay, I'm gonna put myself in service of, the crew as much as I can. At the same time, I did have a particular concern that in these unique conditions, in such an extreme environment as living isolated on a volcano in Hawaii,

the group might fall apart. I mean, in any, isolation, study, you can see that that's always a risk. and I wanted to avoid a situation where you had a, a bunch of scientists working, living together, but everybody's living in their own little room and they just come out to grab some fruits from the fridge and then go back up.

I was like I don't want that. I think that's for multiple reasons. First of all, just for mental health, [00:42:00] obviously. I think it's better that there is a, a good social cohesion. but also moments when unexpectedly things go wrong, you need to immediately move into a, collective troubleshooting mode.

And if you're living apart, isolate it in your own room. That's not gonna work. You just, you're not used to each other, enough. So there are multiple reasons why you would advocate for, Maximizing crew cohesion. So crew cohesion became a bit of a leading principle and I had several little techniques to enable this.

there was always a short, I tried to make it short. It didn't always work. we had a morning meeting where I invited everybody to speak up and just ex just share with everybody else what we were planning for to do for the day. And this kept us informed about each other's, work, but also challenges spontaneously.

People stepped in, like, Hey, maybe I can help with that. So keeping communication going, really important. and also I asked like, listen, I understand that, [00:43:00] you know,

sometimes people need a bit more privacy. You want to be on your own for some, time, but please avoid isolating yourself. And spend at least a part of the day in the common room working with everybody else.

I mean, there are multiple places. There's a blowup sofa there and there's a table here. You know, you can find a spot, but just make sure that we physically, we are physically together at least a certain amount of the day. now interestingly enough, for some of the crew, they were like, well, actually, I.

This is not really necessary for me. I wouldn't mind just working on my own. I don't think I need all these rules of, you know, morning meetings and, and working at, working together in the same room and et et cetera. So one morning I stood up after breakfast and I asked, I invited the crew, like, listen, with these different perspectives on, you know, how, how we could organize ourselves, who would actually love to run this show?

Who would love to take over anybody because there is no central truth in how to run. This place could be run in many different ways. And to my [00:44:00] surprise, four out of five people raised their hand. I was like, oh, that's an interesting situation. So I was like, okay, we'll run a small experiment. every week I will.

step down as a commander and one of you can take over, you can change the rules. I will not intervene. and then in the weekend I will take over again. We'll do an open evaluation and then we take it from there and every week somebody else takes over and we'll see what happens. And that became a huge personal

experience. it was very interesting, just to summarize some of the main experiences there. the first week, one of my colleagues took over and during the open evaluation she said, now I understand what Angelo is going through every single day. So I was like, I had no idea. She was like, I'm one of the researchers here and I'm just focused on my research programs.

But as a commander, you're like, responsible for all kinds of different things, including communication and communication with, with, with mission support and, and [00:45:00] just, keeping that overview of all the activities. And then she was like, I had no idea. So there was a level of understanding that came in.

But then one or two weeks after, one of the people that took over, he was like, you know what? I want to abolish most of those rules and I want to leave as much freedom to people as possible. you wanna lock yourself away in your room for a whole week, be my guest. You can do all of that.

I was like, okay, let's see what happens. So we did that. And then during the open evaluation, one of my fellow crew members was like, man, this was fantastic. I was so

productive. This worked so well. But this did not go down well with me. I emotionally, I was really not taking this well. I was really like, oh my God, seriously, this is better.

Just throwing everything out of the window. I was upset. I went to my room. I was really like not having it. I was just really struggling. and then one of my fellow crew members came up to my room. She was like, okay, you need to calm down. [00:46:00] Let's discuss this. And then we continued the conversation and they were basically like, yeah, honestly, you've been building a foundation. Over the past two months, you really worked on gluing us together as a team. and of course, if there is one week of no rules or less rules, everybody loves that If we keep going like this, the whole thing will fall apart. So try to keep this in perspective. I was like, oh yeah, of course. that makes much more sense.

and honestly, I also noticed that some of the changes that they made. I was like, actually, that works better than what I had in mind. So after the whole experiment, I was like, okay, I'm gonna use that trick that you used. I'm gonna reconfigure the reporting, because that kind of reporting that you did the template, it actually a much better template.

And so that's what it resulted in, a deeper understanding, learning from both sides. But it puts you in an extremely vulnerable position as a leader. I'm not gonna lie, it was not always easy. but once [00:47:00] we, went through the whole pro, the whole process, I, I was actually glad that I did it.

Susan: And that vulnerability leads to growth.

Angelo: Yes. And, and best situations

Susan: In the Yes. Yeah. Yeah. Yeah. Amazing. Thank you for sharing that. And Angelo, our time is up I suppose the question that's been bubbling for me is what? Is in store for the future of our species. And I know that's a huge question at the end, but is there something that you think of often or that you have bubbling up yourself for that?

Angelo: it's the eternal cycle of destruction and creation and I think, yeah, well look at human history. It's the cycles of things going up, things going down. I am not so sure where this is heading right now. I have young kids. I mean, I have one, a, a three and a half year old son and a little one coming up.

[00:48:00] so I'm concerned about the future of course, but the main thing I want to teach my kids is resilience. I mean, the main focus is shouldn't be a very particular skill. I mean, it's important to have, to develop skills and everything, but for me. Resilience tops, everything. It trumps everything.

If you know how to adapt, if you're comfortable with adapting, I think you can handle these uncertain futures that are heading our way. And I think that's really the best to give, to the young generation issue.

Susan: And I do think as humans we are adaptable. We've forgotten it a lot of the time, but we do have that skill.

Angelo: Well, it's both, right? We, I think, I don't think we can live in a constantly changing environment and a constantly changing climate otherwise it's mental overload. you need some stability. But overtly relying on stability and overly expecting stability can lead to a certain, [00:49:00] yeah.

Vulnerability, of course, which might not be good in the long term. Yeah.

Susan: Angelo, I imagine everybody listening to this has kind of had their minds blown several times. So if anyone would like to reach out to you or find out more about you. What's the best way of doing that?

Angelo: you can find me on social media, the typical platforms. I'm on LinkedIn, Facebook, Instagram, or you can drop me an email, which is Angelo at Seeds Network, that's S-E-A-D-S network, and I'll get back to you.

Susan: Fantastic. Angelo, thank you so much for all of that knowledge, insights, and a fab conversation.

Angelo: Thank you so much for inviting me. I love the, I love the conversation.

Susan: Cool. Bye.