Space Capital Podcast S01E08 - View From The Stratosphere with Jane Poynter Transcript

We use high altitude balloon technology. Very, you know, twenty-first century balloon technology. And so, we float on top of the atmosphere. So, we're floating at, roughly, twenty miles above the surface of the Earth. Imagine an ice cube floating on water, that's, you know, in very crude terms how it works.

Welcome to The Space Angels Podcast, episode eight, View From The Stratosphere. I'm your host, Chad Anderson, CEO of Space Angels - the world's leading source of capital for early stage space ventures. The purpose of this podcast is to provide investors with the context and information necessary to understand the real risks and opportunities in this dynamic, new entrepreneurial space age. In this episode, we'll be speaking with World View's CEO, Jane Poynter. World View is pioneering a new frontier at the edge of space and leading away in an emerging stratospheric economy. It's an active full-service commercial launch provider, who's disruptive Stratolite flight platform. It enables previously unthinkable applications at a fraction of the cost of existing technology. Stratolites serve a variety of mission functions and serve a broad range of critical commercial needs and applications. Jane, hello, welcome to the podcast.

Jane:
Well, hi, Chad. Thanks for having me on. This is awesome.

Chad:
You are a very interesting individual with a very unique background. And I would like to start, if it's alright, by giving our audience some insight into what you were doing before World View.

Jane:
Yeah. I've been lucky enough to travel a fairly unusual path. So, I have been involved in, one might call, commercial space for nearly thirty years. And I was originally involved, I started out my career, really, with Biosphere 2 where eight of us were sealed inside a virtual version of our planetary biosphere. And it was a prototype space base that we built right here in Tucson. Eight of us lived inside it. It was materially enclosed. You know, we grew all our food, we recycled all our water, all our air, and all of that. And we lived in it for two years. So, I was on the design team and on the first crew, and it was an incredibly exciting thing to do. I mean, it's just this huge idea that we were gonna take this planetary biosphere and shrink it down into something the size of three acres. And the audacity of the idea was completely crazy, but it actually was technically incredibly well executed.

Chad:
It was a really serious, a bit crazy, endeavor. Like you said, it was trying to simulate an artificial Martian environment, right? And you locked yourselves in there for two years, and there were life and death moments. It was a pretty serious endeavor, right? So, it was a little nuts, wasn't it?

Jane:

So, I suppose it depends on your definition of nuts, Chad. But it was certainly audacious. It was massively ahead of its time. [laughs] Even today, it's still ahead of its time. But, you know, at the time, as a nation, America was heading to Mars. You know, in a very real way. And so, the project was gonna be a part of that. From there, I co-founded a company called Paragon Space Development Corporation with one of the other biospherians, Tabor MacCallum. And that company has been very involved, and still is very involved, in human space flight, and space tech of all kinds. Designing all kinds of hardware solutions, very difficult problems for NASA, for our defense community, for some our commercial communities. So that company has hardware heading off to ISS soon. It's had hardware on just about every single manned spacecraft that has gone up or is going to go up. And it also has some hardware under the sea with very specialized diving equipment and things like that. And we actually spun World View out of Paragon.

Chad:
So now you are the founder and CEO of World View, which your website says is pioneering a new frontier at the edge of space and leading the way in the emerging stratospheric economy. So, what is the stratospheric economy, and what is a stratolite?

Jane:
Yeah. So, yeah, let's talk about the stratosphere economy first. So, you know, when we think about all of the business that is transacted above the surface of the planet, you know, there's trillions of dollars transacted in the troposphere - that's the atmosphere where we all breathe and where airplanes generally fly. And then, you know, three hundred billion plus, growing very rapidly, in low Earth orbit and beyond. And in between, there is an area called the stratosphere, that some have called the ignorosphere because it is now a green field of opportunity, because nobody has really taken advantage of this area at all. It's very difficult to operate there. And so, we're now really developing this new industry, if you will, economy, if you like, but it's a very rare opportunity that you get to march in and be a leader in something as new as this.

Chad:
And we're talking about a huge area, right? It's difficult to demonstrate on a podcast with no visuals, but the stratosphere is a huge area between the troposphere and space.

Jane:
Yeah. So, think about the stratosphere starting at, roughly, fifty to sixty thousand feet and it goes up to, let's say, fifteen miles to not quite a hundred miles. But practically speaking, the areas of the stratosphere that we use are really the lower stratosphere. So, it's where the atmosphere get thinner and thinner logarithmically at those altitudes. And so, we use high altitude balloon technology. Very, you know, twenty-first century balloon technology. And so, we float on top the atmosphere. So, we're floating at, roughly, twenty miles above the surface of the Earth. You know, imagine an ice cube floating on water. That's, you know, in very crude terms how it works, right? So, we're floating up there at roughly twenty miles and we can go up, we can go down. So, we've got this whole three-hundred-and-sixty-degree mobility. The way the stratolite operates is that it can stay over an area that we want it to stay. So we use altitude to control it to go up and down, and use the winds that are going in all different directions in the stratosphere - the stratosphere is called that because the air in the atmosphere is stratified - and so, we're out in

this rarefied atmosphere using these winds going in different directions to either stay in an area of interest or go somewhere very quickly. So, it affords us incredible flexibility. We can stay over somewhere for extended periods of time. You know, we're talking months. And it's really a brand-new capability.

Chad:
Ballooning has a storied history, been using them for decades. How have balloons been used in the past, and how is what you're doing different?

Jane:
Yeah. So, what's really fun when we think about balloons is, yeah, they were really the very first way that humanity left the ground. It was our first flying vehicle. And so, here we are now in the twenty-first century. They've been used early on as a way to really understand how to operate in space. A number of people went up in capsules underneath balloons to test out life support equipment, you know, in those very early days. People didn't really even understand that as they went up in altitude, the oxygen went down to the degree that it did. So, they even learned, you know, fundamental things about our atmosphere. We learned about the bends and how to combat them. They've been used for surveillance. But, you know, NASA has developed systems that been able to stay up for very long periods of time, like a year-plus is the record, but without any ability to stay in one location. They couldn't navigate at all. They were flying, all of these systems in the past, were flying really at the mercy of the winds. Wherever the winds were going, that's where you were going. That's really the major innovation of today, of what we've done.

Chad:
And that's the ability to not be at the mercy of the winds, and to direct your balloons where you want them to go.

Jane:
Yeah. That's exactly right. So, we- we do go with the wind. So, in that sense, we're still using the winds and the directionality of the winds. However, because the winds are going in different directions at different altitudes, we can go up to get it into a wind stream going in one direction, then we can go down, get into a wind stream going in the other direction. So, if you want to stay over a location, you go up and down - It's almost like going up and down a barber pole. Think of it like that. You're going up and down very slowly, circulating over this area. Going up and down slowly, getting into the different wind streams that allows you to stay over a particular location. That- that's innovation of how we do that. That's one of the innovations with the Stratolite.

Chad:
Great visual with the barber pole. And so, in 2014, you helped Alan Eustace, a Google executive, fly further above the surface of the Earth than any human not aided by a rocket. And there is a wonderful film about this called, 14 Minutes From Earth, that everyone should watch. Can you tell us, you know, about your involvement in StratEx, and how that fit into the formation of the company?

Jane:

Yeah, for sure. So, technically we did StratEx with Paragon, but the core team that did StratEx was the core technical team of World View. It was incredible for the team to do. I mean, what a great way to launch a company, to have the team do something like this. You know, it's all about us, about high altitude ballooning. It gave us a lot of technical underpinning for the company, so it was very exciting. So, what we did was, in three short years, we went from a drawing on a napkin to dropping Alan three times from high altitude balloons. And that sounds so simple, but it was so hard. Because we had to develop a whole bunch of different technologies. One of them was we had to actually build a brand-new spacesuit, from scratch, and test it and fly it. It had to go through all these different flight regimes. And did that in three years, and it was the very first time that a new spacesuit has been built and flown in like thirty or forty years. So that was pretty awesome. And then we had to develop a way for him not to spin wildly out of control. You may remember that Felix Baumgartner did it before him, and he didn't use anything to stop him from spinning. And the person that did it before him, Joe Kittinger, did. It was called a drogue chute, and it's like this little chute that goes out. It doesn't really slow you down, but it stops you from spinning wildly. But Joe, when he put his drogue chute out, gets all wrapped up and almost dies. He doesn't. You know, he gets- You know, he passes out, he comes to, gets himself unwrapped, and then he opens his chute and comes down safely. But, you know, with all of that danger, then Felix Baumgartner didn't use a drogue chute and almost spun out of control. So, our team had to come up with this great new way of doing it, so that he wouldn't spin out of control. Which they did. And we actually use that today with our Stratolites, and a whole variety of other things. So, it was incredibly technically successful. Everything about it was awesome. The team learned a huge amount, and I am very glad we don't ever have to do it again.

Chad:
[laughs] It is truly wild. [laughter] If you haven't seen the video, I mean, I watched it- I watched that movie premiere at the Explorer's Club here in New York. And I gotta tell you, the whole room was packed, and people were standing and clapping at the end. I mean, people were just in awe. I mean, it's incredibly complicated, way more complicated than you think.

Jane:
And Alan Eustace was awesome to work with, I would say. He was just- You know, we wouldn't have done that with just anybody. We're putting our company at risk having somebody like that, you know, in a spacesuit, taking them up to that kind of altitude, because, you know, they have to behave. They have to do things. And, you know, he wasn't a professional. But he was a skydiver, extremely experience skydiver. But what's so special about Alan that he's an engineer's engineer, and a very cool customer. And so, you know, when we were up there, you know, he just really kept his cool. And it was just amazing. It was really amazing for the team to get to know him and to work with him. It was an honor.

Chad:
Yeah. And it seems like - I don't want to say crash course - but when there's so much at stake, like you said, your team was very capable and did an excellent job and everything, you know, the mission was a complete success. But you learned an incredible amount in a really short period of time it sounds like.

Jane:

We did. And so, you know, there are many things that apply to World View from that, but certainly one of them, from a company point of view that we learned, is the power of a small team to execute on a big idea. And this another big idea, right? Taking a guy up to- So, remember, he was not in a capsule. He was in a spacesuit hanging from a balloon. Which was very counter-intuitively more simple than actually having him - and safer - than having him in a capsule. Our team just did a spectacular job with that. And so, we learned to take that small team and do something as complex as developing this brand-new vehicle, the Stratolite, with a very small team initially. And so, it was fantastic.

Chad:
So, the first company operating in the stratosphere. What is a Stratolite, exactly?

Jane:
So, a Stratolite, as the name implies, is, you know, somewhat similar to a satellite in concept, except we're operating down in the stratosphere. And we are providing anything that you can imagine you can do in space; we can do down in the stratosphere. But very differently. And, you know, what's really differentiated about this technology is that we can stay over an area of interest for extended periods of time using this sophisticated high-altitude balloon technology. And so, we can do remote sensing, we can do communications in remote locations, all kinds of weather applications, and perhaps do that all on the same Stratolite at the same time because we can fly multiple instruments at the same time. So, it's an incredibly diverse, versatile platform that the team has developed.

Chad:
So, World View is not developing the payloads, the instruments, it is developing the balloon and that's really your expertise. So, are you a high-altitude balloon platform that other companies develop these payloads and then they put them a standard structure that your built? Or how does that work?

Jane:
Yeah. So, our core expertise is in the stratospheric flight, and we do integrate customers or third-party instruments onto our Stratolite to meet our customer's requirements. And, you know, we can envision in the future, you know, all kinds of analytics being onboard the Stratolite as well. So, you can have all kinds of applications that we're doing on this Stratolite. You know, it's exciting that we get to be instrument agnostic. We can really fly anything. So, that allows us to, for example, do day, night, and all-weather remote sensing, you know. We can fly synthetic altitude radar at the same time as RGB, NR, IR. AIS if we wanted to. All on the same Stratolite. So, yes, there are so many instrument providers out there. And in fact, what's exciting is that we can use pretty much off the shelf instrumentation that's developed either for aircraft aviation applications or space applications. You have a little bit of thermal control that we need to- need to work on for instrumentation, but otherwise you can pretty much take any instrument and fly it. We've flown an off the shelf consumer camera and had extraordinary results. So, you can really use a whole variety of instruments.

Chad:

And so, you named a number of different acronyms earlier, but really what you were talking about is these are all the different payloads that people are putting on satellites, right? So optical sensors where you can just take images, radar so you can see through clouds and at night, all other different types of spectral bands. Basically, building out a varied data set to provide end customer solutions. So, it sounds like you have the same type of payloads on your Stratolites as companies have on satellites that are in orbit. So, what are the benefits of Stratolite versus other high-altitude platforms, like satellites and UAVs? You mentioned the ability to loiter over an area for an extended period of time. How else are Stratolites better than the other platforms?

Jane:
So, the loitering, I think, is sort of the cornerstone differentiation. Think of it as a geosynchronous satellite, except down in the stratosphere. You know, we're not whizzing overhead at seventeen thousand five hundred miles an hour. We're, for all intents and purposes, stationary over an area. And so, that just affords huge capability that isn't currently available for all kinds of applications. You know, then, you know, another capability is that we can fly, you know, in multiplicity of instruments all at the same time. Which you really can't do on CubeSat. You need, sort of, like a small sat to do that. So just being at that vantage point, I mean, think about a UAV, there are very UAVs that can fly at very high altitude and that's sort of the closest to thing to what we are in a sense, I suppose. The ones that can carry any appreciable payload, anyway. Appreciable amount of instruments. But those UAVs can't stay up for very long. You know, the longest one, really, is just a few days. So, the cost is massively different, as well. Right? So, the cost of these high-altitude balloon platforms, our Stratolites, are vastly different, as well. And when you think about flying, you know, constellation, to get any kind of persistence over an area, you need a constellation of satellites not just a single satellite. And so, the cost is just vastly different, as well.

Chad:
Yeah. And so, when I try to think about how this would be used, the first thing that always pops into my mind is city planning, city monitoring, monitoring ports. That sort of thing. You've got an area of interest, a lot of activity. Where do you think that this technology is going to have the greatest impact?

Jane:
Yeah. So, there's all different kinds of impact, right? [laughs] What's very exciting is, and a fairly unique opportunity for us, is that we have way, way more demand than we're able to handle for the foreseeable future. And when we start talking to customer about this, the capability is so different and unique of being able to really provide persistence. You could even think of it as permanent vision, if you will, over an area. You know, what we find is that the customers themselves, because they haven't had this capability before, you know, they start out with sort of all the normal things, and then they start, you know, coming out with all these ideas that we have never even imagined. And so, I suspect, you know, that we haven't even thought of the ideas that are gonna be the ones that are most impactful, because it's just this very different way of operating and very different capability. You know, from a humanitarian point of view, and I'm very excited about some of the things that we can do, you know, with weather and disaster response. You know, if you can envision have a Stratolite over a hurricane, for example, with the right instrumentation on it, you could vastly improve the trajectories. You know, we've already

greatly improved trajectories of where hurricanes are going over the last decades. But, you know, you still have people wondering all over Florida trying to figure how they're gonna stay out of the hurricane, and we could really narrow that trajectory with these instrumentations that we could do just sticking over the hurricane. And then you can also put other instrumentation on it to help first responders, so they have eyes in the sky and immediate communications. You could- You know, there's all kinds of companies that want to be able to understand what's going on, you know, with the power grid and the like in the disasters. So, you know, disaster response and support, I think, you know, from a whole variety of areas, is going to be very exciting. Tornadoes is another one, right? Where people only get just a, literally, a few minutes of warning right now to stay out of the way of an impending tornado. Whereas, with the right instrumentation on a Stratolite looking down on where the key indicators are for- for a tornado about to occur, we could extend that to hours. So, you know, it's very exciting to think about, you know, the way that we can save lives and impact people's lives with this. As well as have an incredibly thriving business.

Chad:
Yeah. It's incredibly important data and incredibly important work that you are doing. So, founded in 2013, 2014, you've now taken on a few rounds of financing, which Space Angels has participated in. The last round was a Series C led by Excel Partners. You've come a long way in these four or five years. Can you talk a little bit from the entrepreneurial perspective, as the CEO who has founded the company and been through all this? How have things changed over that time, and how have you managed that change? And how do you think about where you are now, you know, looking forward into the future?

Jane:
Yeah. So, you know, if you go to our website, you're gonna see a whole range of things that we want to do in the stratosphere, including human flight one day in the future. Right? And that was actually the inspiration of World View, was one day taking people to the stratosphere and was actually how we started the business. And frankly, we had sort of written off the idea of using balloons as, in the way that we're using it now, because we assumed that if there was a market there somebody else would be doing it. Oh boy, were every wrong. The moment we announced ourselves, we got an inpouring of requests. "Can you do this? Can you do that?" And we went, "Huh. This is- this is extraordinary." And so, we actually, very early on the company, opened up the aperture of our business strategy to include doing what we now call Stratolites. And in fact, changed strategies a little bit to where we flipped it. Instead of first being the space tourism company, we're first a Stratolite company because that allows us to, not only get this robust business going, but also, frankly, allows us to, you know, really perfect our operations, our manufacturing, our flight systems with instrumentation long before we ever take people. So, you know, that's one way in which the company has changed pretty significantly and grown significantly in the way we think about the industry since we started, which is incredibly exciting.

Chad:
Jane, this has been great. Before you go, we like to end on one last question. On the show, we like to say that there has never been a better time to get involved in space investing. Can you give us your personal perspective on that?

Jane:
Wow. It is unbelievable. I mean, you can probably hear the excitement in my voice. Took a long time to get here but, boy, are we here. Of course, it's all rocketry bringing down the price to launch. We've got all of the different satellite aspects. We've now got the stratosphere that's bringing in a new aspect of capability of things- of different applications we can address from high altitude. You know, and then, of course, you get into the analytics, because that's key. You know, without the analytics, it's gonna be, you know, a limited market, and the analytics are really helping bringing a whole new customer base to this. So, we're also seeing, you know, the enterprise market really beginning to grow. You know, it was very defense driven. You know, it was very difficult to really get huge enterprise, other than in communications involved. And so, now we're really seeing in the remote sensing area, anyway, really beginning to see that blossom because of all the analytics coming in. So, you're just seeing this groundswell of activity that is really creating this robust, robust environment. Yeah. I think- I think it has a huge future. It's very exciting.

Chad:
Perfect. Thank you. Always good talking to you, Jane. Thank you very much for your time today.

Jane:
Well, thank you, Chad. It's been fun.

Thanks for tuning into The Space Angels Podcast. As today's episode has made clear, there's never been a better time to get involved in space investing. So I want to invite you to visit our website, Space Angels dot com - where you can learn all about Space Angels membership and how you can get involved in this exciting new sector.