The Space Capital Podcast Season 1 Episode 20
Climate Sats Transcript

Our goal, our vision, is to provide global monitoring of greenhouse emissions. Not just methane, carbon dioxide as well. Because, if you think in the bigger picture, this can not only help operators understand their own emissions, it can help markets form for low carbon solutions.

Chad:
Welcome to The Space Capital Podcast. I'm your host, **Chad** Anderson, managing partner at Space Capital, an early stage venture capital firm investing in the space economy. Specifically, focused on unlocking the value in space technology stacks, GPS, geospatial intelligence, and communications. You can find us on social media @Space Capital. Space-based technologies are the building blocks of innovation. And in this podcast, we explore what's happening at the cutting-edge of this new entrepreneurial space age and speak to the founds and the innovators at the forefront. This is The Space Capital Podcast, and today we're speaking with **Stephane** Germain, CEO of GHGSat **Stephane**, thanks for joining us.

Stephane:
Thanks, **Chad**. Appreciate the opportunity.

Chad:
So, today, we are talking about climate change and satellites. Uh. To kick things off, I thought it might be good to start at the beginning. So, can you help us understand the problem here? What is methane and why is it so important for us to understand it?

Stephane:
Well, the- the two major greenhouse gasses are carbon dioxide and methane. There are several others, but those are by far the most important ones. Carbon dioxide is a relatively well understood, um, source of emissions. Generally, it's produced from combustion processes, and the input fuels in the combustion processes - whether it's your car engine or a thermal generating power plant - are relatively well known. And so, the estimates of what can come out for carbon dioxide are reasonably well-bounded. Methane, on the other hand, is, uh, about over fifty percent of methane emissions are fugitive. That means they are not easily understood. They're either accidental, or they come from leaks, or they come from unexpected places. And so, methane's really important because it tends to be primarily fugitive, and also because it's got a bigger short-term impact on the planet than carbon dioxide does. So, that greenhouse gas warming potential of the methane gas leads to a- a greater short-term, and therefore, more important, I would say, even impact than carbon dioxide for a lot of industries.

Chad:
Why is it so much more dangerous?

Stephane:
It's just a factor or how it reacts with the atmosphere and the greenhouse warming effect that greenhouse gasses have within the atmosphere. It's just a question of the chemistry.

Chad:
Hm. And so, how does it come about? Methane, I mean, it's from biological and industrial.

Stephane:
Correct. And that's actually a really important point. Because there's a lot of methane that's actually just purely natural. It comes from things like peat bogs, from wetlands. Uh. It comes from animals and, um, just natural, uh, farming- or not even farming, just natural existence of animals that produce methane. Um. When you pull ten thousand head of cattle into a feedlot, you'll get a whole lot more methane and, therefore, that is one of the industrial sources of methane to look at. But even on a natural scale, there's a lot of methane produced by, just by- by animals. So, there's a lot of natural sources is a key point. However, there are some very significant industrial sources as well. And so, the most important industrial sources are oil and gas, um, power generation, coal mining, agriculture, and waste management or landfills. There are others. Um. So, there's various forms of agriculture. So, one is the one I just mentioned. Like, animal feed lots. Another one is rice farming, believe it or not. So, uh, rice paddies can actually generate an awful lot of methane as well.

Chad:
Okay. And then, so for oil and gas, I've heard that reducing these methane emissions is one of the most immediately actionable ways to abate climate change. So, and that's because it can be sold. How does that work?

Stephane:
Well, the- In the oil and gas, um, context, methane is produced in a lot of different ways. So, first of all, when you drill for oil, almost always there will be some component of gas present with the oil. There's usually a mix of both. Some will be predominantly oil wells, but some will be predominantly gas wells. And the gas that is produced, the natural gas, is primarily methane. So, the- It starts with the drilling for oil and then, more recently, drilling for gas. And then everything in the value chain from that well through to an LNG terminal, to your house, to your stove, to eating some carbs now, all of that is, uh, that whole chain has potential for leaks all along the way.

Chad:
These types of facilities, oil and gas facilities, do they all contribute to methane in the atmosphere? Or is it a few? Like, how is it distributed globally?

Stephane:
So, there is, uh, let's take that there's several different clients. Like I said, there's several different industrial sources of methane. But let's focus on oil and gas. And even within oil and gas, there's several different types of sources. So, you can have, you know, a leak in an LNG terminal. You might have a compressor station that has a number of compressors that each naturally leak. But if we just look at shale plays for a minute. In shale plays, which are places that have a high density of oil and gas production, and there are several all across North America but also in other parts of the world, you tend to have a distribution - and there's been a number of studies published on this - where a very small number of sources are responsible to a very large majority of the emissions. And that's for different reasons. Some of them can be because things are broken, but

other things are just because there's been an event that, uh, like, um, a nat- a normal production event that just happens to release and awful lot of gas. So, that distribution means there's a big challenge in trying to find the biggest leaks fast, and that's where satellites are most effective. Because, um, you may be dealing with several hundred square kilometers worth of territory in a shale play and tens of thousands of pieces of equipment. So, if ninety-five percent of those are actually just leaking a little bit, and five percent are responsible for ninety percent of all the emissions, then you really want to find that five percent. And satellites are the best way to cover a lot of territory quickly, looking constantly, continuously for leaks or emissions.

Chad:
Makes a lot of sense. And so, how are they doing it today?

Stephane:
Today, they use handheld cameras or handheld instruments that're just different flavors, but probably the most popular one is what's called an optical gas imaging camera. And, uh, it's like a small camcorder, um, or even an iPhone, that you walk around with, and you literally just point that every piece of equipment you want to look at and you look through the viewfinder for wisps of what looks smoke in the infrared. And so, they visually go verify valves, flanges, flares, wells, looking for leaks. So, every site, we'll take, depending on the complexity of the site, of course, could take a few hours. And so, they might do two, three, four sites in a day, and then there might actually be, you know, hundreds of sites within, let's say, a hundred square kilometers and that would, therefore, take, you know, a week or two to measure. With a satellite it takes twenty seconds to do a hundred square kilometers, and there is the value.

Chad:
Right. And so, that's- Yeah. And that's what GHGSat's doing, right?

Stephane:
Exactly.

Chad:
I mean, you are- you are building, manufacturing, launching, operating these satellites to do exactly that. Can you tell us a bit about GHGSat? Your vision, the genesis of the company, how it came about, and what it is that you're doing?

Stephane:
Sure. So, the inspiration for the company was in 2010 when the State of California and the government of Quebec formed a, uh, cap-and-trade scheme called The Western Climate Initiative. So, it's potentially putting a price on a ton of carbon. The idea being, if there's a market mechanism, if you have to pay for the right to emit, then you're gonna think twice about how much you emit. And in every year, um, the regulators for that mechanism will decrease the amount of permits that are allowed, and, therefore, increase- there's a reduced supply, there's still a constant demand, the price will go up. So, the only way for the price to go down is for the supply to go down, or the- the demand to go down. So, at the end of the day, that mechanism is, uh, and that concept of having a price on carbon, inspired me and us, my partners, to look at how we might be able to help companies better understand their emissions. Especially for things like

methane, which are less well-understood. Um. So that they can better control and ultimately reduce their emissions and their financial risk. So, it started like that. And over the years, fortunately in some respects, and unfortunately others- in others, climate change has become just an increasingly, uh, large issue and an issue of concern for almost every place in the world. And therefore, there's been more and more interest and demand in transparency, in having access to data about, um, what- what are these emissions? Why are they happening? How do we find them quickly and eliminate them, if you're the operator? Or if you're a government, understanding the patterns so you can adjust your policies appropriately to motivate the operators to reduce their emissions. So, that has turned into what, to begin with, was, we thought, a great business case has become an even better business case because of the increase in demand for this type of data.

Chad:
And that should only continue to increase, right? I mean, at the moment, we're working with very small amounts of data. So as you bring more information to the table, you'd imagine that that would continue to keep the ball going.

Stephane:
Absolutely And, in fact, right now, there's- there's a race to get new technologies, new analytics, using those technologies to better inform the operators and the regulators of- of what's out there. And we find ourselves in a really fortunate position, that we've been at this already, we launched our first satellite four years ago. We've got, at least, a five-year head start on anybody else that wants to do this from space at a facility level. And, uh, so we're in a great position. We're really excited for the next launch, because it's gonna further advance our- our competitive lead.

Chad:
That's great. And so, you are positioning GHGSat to be the leader in this? In what exactly? Just information about methane, generally, or is there a specific niche that you focus on? Like, what's your secret sauce?

Stephane:
Well, so our- our major differentiator is that we are able to measure individual facilities. We're able to measure facility-level emissions. And we can do that anywhere in the world. So, we're the only people in the world who can do that today from a satellite. And so, our goal, our vision, is to provide global monitoring of greenhouse gas emissions. Not just methane, carbon dioxide as well. Because, if you think in the bigger picture, this can not only help operators understand their own emissions, it can help markets form for low carbon solutions. So, you can use transparency in carbon dioxide emissions from steel plants, or from aluminum smelters, or even from oil and gas facilities, to reward the operators that have the lowest climate impact, and indirectly, therefore, penalize the ones that have the highest climate impact. But you need transparency in emissions for that to happen. And transparency means, literally, everywhere in the world, because there's global markets for some of these commodities, and certainly all the ones I just mentioned. So that- that's the big picture vision and the big picture impact that we can have. It's- it's, you know, as a business, we think there's a huge business and profit opportunity. And, as environmentalists, there's a huge impact opportunity.

Chad:

Yeah.

Stephane:
So, the two together are a win-win.

Chad:
Awesome. And there's a very real example of- of GHGSat identifying, and finding, and just taking it through the entire- the entire process from identification to dealing with it. And it's really interesting, because I was picking up on what you were just saying, where it is a global market and, whereas some entities, organizations, geographies, are more interested and have a more progressive policies where it comes to climate change, others might not. But then, if they want to sell to those countries that do, then they do need to pay attention. Right?

Stephane:
Correct.

Chad:
And so, there's a lot of really interesting dynamics going on here. The Turkmenistan example is- is a really great one. I think it's just a really great representative example of like the whole process. So, can you tell us a little bit about, I mean, people have probably, very possibly, read about it already in like The Economist or Scientific America or something, but it'd be great to hear from you, you know. Um.

Stephane:
Sure.

Chad:
How it all came about.

Stephane:
It's a pretty good story. [laughs] So, it started with extra capacity onboard. When we have extra capacity, we use it to go look at places that might be of either marketing interest or scientific interest. So, it just so happens, there's these natural sources called mud volcanoes that are in and around the Caspian Sea. And so, some scientists asked us, "Can you go look at this particular one in Turkmenistan?" So we did. And, frankly, it was a bit of a yawner, we didn't see much. It was quiet. Uh. And what caught our attention was just off the edge of our field of view, was a massive source. And we were really taken aback, wondering what is was. So, we went and took a closer look, and realized it was actually a very large source of methane coming from an oil and gas facility. So, um, we, uh, went back in our archives, confirmed that this was real, and we kept monitoring, confirmed it was real, and then we contacted the European Space Agency. And, um, asked them, because they also have a satellite that monitors methane but on a much larger scale, um, we asked them, "Hey, can you see this too?" Because they might not be able to pinpoint where it is, like we can, but could still be able to see the regional change in emissions. And sure enough, they could. And that, in itself, by the way, is a great story because it was the beginning of a fantastic collaboration with the European Space Agency and with the Tropomi satellite. But, um, with that confirmation, we now decided that, uh, we had enough information - because we

wanted to be credible about this - to then approach the authorities, the operators, of that facility and say, "Hey, look, here's what we see." And we did that privately, right? So our approach is we'll work with the operators to help them understand what we see, and then, uh, monitor to help them track what they're actions result in. So, with this particular operator that- it's not easy to contact them. So, uh, we tried directly. Didn't get very far. And eventually, to make a long story short, we had to work through three different ambassadors, including, you know, Canadian, US, and European ambassadors to, um, eventually get the message through. And sure enough, it got shut down. So that one emission, which as it turns out was what's called an unlit flare, uh, led to illumination of about a million cars per year worth of emissions. Just that one leak.

Chad:
No small leak. Right? This is- this is-

Stephane:
No. That was a big one. It was a big one. But you know what? I can tell you right now, there's several others like that. So, everyone is a challenge and it's- it's- In a global context, you're dealing with different jurisdictions, different operators, different governments, and some are more progressive. As you were saying, right. And others are a little less transparent and can take a bit more work to get to. But always our approach is respectful, it's cooperative, and is trying to, you know, make them realize that transparency is here. You know, you're- you're gonna have to face this at some point, so let us help you address what we're seeing.

Chad:
Yeah. It is. It's a really interesting story. And, for me, the two things that really pop out are, uh, one, the importance of satellites and using satellites for this. Um. Because this wouldn't have happened if you were walking around, doing it with, you know, with a handheld camera. Just wouldn't have happened.

Stephane:
Never would have been spotted.

Chad:
And then also, seeing this information, it brings to mind that there's- that these things happen, and we didn't know that they were happening.

Stephane:
That's right.

Chad:
And, you know, you just mentioned there's a few others.

Stephane:
We've brought it closer to home too, by the way. So, I mean, some of these are faraway places, but, uh, you know, even in our own backyard, very simple things like a wind storm can come through and blow out a whole bunch of flares. Now, they're supposed to be designed to restart, in most cases, but when they don't restart, they'll just keep venting depending on the control

systems they have. But several of them will just keep venting, until they either eventually relight or the operator spots that they should be relit. Or until we come along and say, um, or somebody else and says, "Whoa. You got a big leak there."

Chad:
Yeah.

Stephane:
So, it- sometimes it's- it's just it's by no ill will, there's really large sources in our own backyards. So, it's not just in faraway places.

Chad:
Yeah. Interesting. Okay. And so, with regards to other platforms, you've mentioned that ESA has - European Space Agency - has their own satellites that are detecting similar gasses, and the Environmental Defense Fund is doing this, and there's other organizations as well. So, how do you- how do you view your place, um, with regards to these other, uh, capabilities? And, you know, you mentioned that it was complimentary. You know, how does that- how does that all work and how do you think about that?

Stephane:
So, our- our system is designed to see individual facilities. And that, like any system, there's always trade-offs. You gotta make choices. There's nothing that will do everything. So, our system is designed to see individual wells, individual compressor stations, individual facilities. The- the trade-off for that is our field of view is pretty small. We'll take, uh, about a hundred square kilometers, a hundred-and-fifty square kilometer picture and then look at everything within that. But we can't see the whole world all the time. Right? Tropomi, on the other hand, this European Space Agency satellite, is designed for the other bookend. Which is, they do wanna hoover up data on the entire planet every day and they wanna use that to inform climate change models. The trade-off for them, is that they're pixel is about seven kilometers by seven kilometers. So, you- you can't see what's going on within that pixel. But they can point us to hot spots. And that's how we're really complimentary and work really well together, cause if they see something fishy in a part of the world that there's a hot spot there, they can point us to that and say, "Hey, why don't you take a look?" And that's exactly what we've been doing for about the last eighteen months. And we've been very successful at it. There's- there's a- It's a tough business. There's a lot of, uh, false positives and we're refining our system and, you know, as our next satellite goes up, it'll be yet another iteration of- of improving how we work together. But so far, we've been successful about thirty-five percent of the time. And I think that's a great start, but clearly, we got a lot more to do together. MethaneSATs a great initiative. The fundamental concept of MethaneSAT is to look at regional emissions. So, it's not necessarily the whole world all the time, but it's to look at something like a shale play, like the Permian Basin in Texas, and be able to see the total variations in emissions in the shale play with really impressive precision. And that means they kind of fit halfway in between us and Tropomi. They've got- each of their pixels is designed to be about, aggregated, a kilometer by a kilometer, which then allows them to cover a much larger area than we can. Not the whole world everyday. So, again, between two- Um. And they can see some sources if they're big enough, um, and so they can also do some

attribution. But they would still work with us to- if when they see a hot spot, to point us towards those hot spots so we can go find out exactly who it is if they can't figure it out.

Chad:
Yeah.

Stephane:
Which I think will be a, you know, a significant proportion of the hot spots they find. So, that's how, you know, between those three systems, they complement each other.

Chad:
Yeah.

Stephane:
Tropomi and GHGSat have proven now that we can do this, and we're about to prove it again on our next satellite. Uh. MethaneSATs still have to prove it, but I mean they've got a fantastic team behind us- behind them. They- they are launching, I think, it's 2023 now. Um. But, uh, you know, when we see all three working together, it'll be amazing. And then, the European Space Agency just got funding approved for a system called CO2M, and it's a multi-billion dollar system for, um, it's their next generation satellites for monitoring carbon dioxide and methane. And it will have a two-kilometer resolution. So that, again, will fit in the range, in the spectrum, of - no pun intended - but in the range of spatial resolutions that are available, and it will also be complimentary to us. So, we're very much looking forward to working with them to address both carbon dioxide and methane.

Chad:
It's really helpful to hear how it all fits together. So, let's talk about the satellites. You've already launched on in 2016, you mentioned.

Stephane:
Yep.

Chad:
And you've been getting some really interesting data from that, we talked about that a little bit. But the big news is that you have a satellite on the block, and it's about to get launched into orbit.

Stephane:
Yep. It's very exciting. It's always exciting to launch a satellite. So, it's launching on June 18th on Arianespace Vega rocket from Kourou in French Guiana. It's gonna be one of fifty-two satellites on that launch. So, it's one of these multi-satellite missions. This next satellite is gonna have about ten times the performance improvement versus our first satellite. So, our demonstration satellite was just that. It was proving that we could actually measure facility-level emissions and to do it from a tiny satellite. I mean, both those, you know, you can imagine in 2010 when we said, "Yeah. We're gonna be able to measure the hundred times higher spatial resolution at one percent of the cost of what national agencies do." There was a bit of skepticism. [laughs]

Chad:
Yeah.

Stephane:
So, the demonstration satellite was to prove that, yeah, we could actually do it. And so, we obviously need to get everything right. And the mission was really successful, but we found some things that we clearly needed to improve. And we've implemented those on our next satellite. We also, by the way, implement them on an aircraft and so we're really excited to see the, based on the results of all the testing we've done and the aircraft results, we're really excited to see what's gonna come out of this next satellite.

Chad:
And are you gonna use the aircraft going forward? Is that a way for you to, when you identify something, to- to then fly in and then get some really great resolution?

Stephane:
Yes. Absolutely. So, the- the combination of the aircraft and the satellite is, um, called a hybrid service, is really useful in shale plays. Again, it's these niche that regions keep coming up, but places where there's a high density of facilities and, uh, where there's an advantage to it being lower detection threshold. So, satellites are awesome for seeing large areas, like that hundred square kilometers I was talking about, in twenty seconds. But a hundred square kilometers can take a better part of a day with an aircraft and can take a few weeks with a handheld terminal. So, um, the advantage you have with a satellite is you'll do it quickly, cover a lot of territory, but your detection threshold will be higher because you're at five hundred kilometers altitude. With the aircraft, you are flying it, you know, let's say, somewhere between one- and three-kilometers altitude, depending what you want to do that day. And your spatial resolution will be a lot lower sub-meter. And you're gonna get a detection threshold about, again, another ten times better than the satellite. So, you can see smaller leaks.

Chad:
Yeah.

Stephane:
So, if- if it turns out, I said earlier, five percent of sources are responsible for ninety percent of leaks, uh, ninety percent of total volume of emissions. You know, that- that- Finding the one percent that's the biggest that, you know, the satellite can do really, really well. Finding the, uh, six percent or seven percent, the extra bit that's higher, with the aircraft allows you now to provide a whole range of capability with satellite in the aircraft at different cost points that allow you to go get even more, um, facilities, or even more leaks, at a more modest cost in doing optimal gas emission.

Chad:
Yeah. It makes sense. And then, so, the names of your satellites. Uh. Claire, Iris, Hugo. Uh. What's the story behind that?

Stephane:
So, the story is that they are the names of the children of our team members. So, we've named every one of our satellites after the daughter or, now, some coming the son of different team members. Uh. Fortunately, we've got a lot of kids in the pool, so we're good to go for awhile. [laughs]

Chad:
That was my next question, is how big is your constellation? Who's your next constellation?

Stephane:
Yeah. Well, we- we're good for at least for the next ten.

Chad:
Okay. [laughs]

Stephane:
And fortunately, the team's growing. So, it's gonna, you know, we're hoping the baby boom will continue.

Chad:
That's great.

Stephane:
Basically, it's to remind us of why we're doing this.

Chad:
Very nice.

Stephane:
Right? At the end of the day, we're doing this - not just for us - but actually, primarily, for future generations.

Chad:
I love that.

Stephane:
That's the theme of climate change in many ways.

Chad:
That's fantastic. Okay. So, I wanna talk about the market a little bit. I mean, you're a venture backed company. Um. And so, while you have a very impactful mission, you're focused on building a business here.

Stephane:
We are.

Chad:
So, how do you think about the market potential for what you do? How do you size- how do you size this market? How big is it and- and why is it that big?

Stephane:
So, there's two levels to that answer. The big picture answer is that, there is a- an eighty billion dollar carbon market out there today, and there is even another twenty-plus billion dollars in, uh, financial opportunities. So, financial market opportunities for derivative data, um, weather analytics opportunities for derivative data, and a complimentary EO, Earth Observation, opportunities, even beyond just greenhouse gas monitoring. But let's get back to that big chunk which is the carbon monitoring, or the carbon market. Um. Really, what we're serving at the end of the day is giving the tools and transparency that the, um, carbon markets need to be able to really be efficient. And so, that's what- that's the underlying market that we are serving. Our beach head within that is methane in oil and gas, and methane in waste management, and methane in power plants, and so on. And that's- that's much more modest. We're talking maybe about single billions. But even that is a healthy beach head to get going. But the larger opportunity is- is- is really it's almost as big as your imagination can take you, because of all of the impacts of derivative data. So, let me bring that home with an example, just so you can see what I'm getting at. So if, as an asset manager - an asset manager being a financial asset manager - you want to finance a new type of investment in the shale play. You're probably gonna insist that there be a certain environment key performance indicator related to that, and it'd probably, one them, one part of that, will be greenhouse gas emissions. So, it will be really important for you to know that the methane intensity assets you're investing in truly is below that KPI. And, like it or not, self-reported numbers are less trusted than third-party measure numbers. I think that's true pretty anywhere, that's why auditors exist. [laughs] So we serve that role and are being asked to serve that role for financial markets, for example. So that's how the derivative data - it's not that the concentrations of methane per pixel that we're measuring that have the scientific community excited, it's the- Is that facil- What's the methane intensity of that collection of facilities that we're investing and financing in support of that.

Chad:
Got it.

Stephane:
So that derivative data is what matters.

Chad:
How interesting. And then you're having some success clearly, I mean, it's not just the launch that's upcoming, you've also been recognized for your work. You were at the World Economic Forum this last year, um, having a chat with Al Gore about what you're doing. Uh. The World Economic Forum, uh, recognized you as one of the leading companies in this field. So, what can you tell us about- about that? And, I guess, the recognized leaders that are focused on these issues looking to GHGSat and seeing you as a clear solution.

Stephane:
Yeah. It's just amazing to get that kind of recognition. We've been really fortunate, um, in some place- in some ways, we're at the right place at the right time with the right technology. Right? So, at Davos this year, for example, the top five risks identified by the participants were all planet related. So, when we showed up in the discussion and talk about what we can do in terms of transparency for all aluminum smelters in the world, to measure every single one no matter what part of the world you're in, you know, eyes got wide. And people started realizing the implications of that, as much from an operating point view as a financing point of view. And, ultimately, reducing total emissions. So, we're fortunate, we're really appreciative to the recognition from the World Economic Forum. And that allows us- it opens doors, because we now have direct conversations with very influential people. And on top of that, it allows to, frankly, dream big and- and think big. Because you go to a place like Davos, and you're talking to people who truly think about how I can change mega-tons of emissions and switch entire energy supplies for entire sectors, and they can actually do it. Right? So, it's- it's fascinating to be in that kind of environment. And it's not just the one event. The- that- It follows on over a series of events over several years, and we're really fortunate to be part of it. And the World Economic Forum is, you know, we're lucky, it's just one of them, there's been several others that we've recognized as well and hopefully a few that we announce soon. [laughs]

Chad:
Cool.

Stephane:
A little delayed by COVID. But, uh, you know, we're pretty excited and we're in a good place.

Chad:
That's great. And then you're also having, um, success working directly with oil and gas companies.

Stephane:
Yes.

Chad:
So, you have a framework in place for monitoring services with Shell, for example.

Stephane:
Correct. Yeah. So, the way that works is, um, and- and frankly, that's our primary customer base. Is to work with operators not just- not necessarily oil and gas, operators of every one of the segments we- we, um, are targeting. To help them reduce their emissions. We- we strongly believe that the greatest change at the end of the day will be from working within the tent and helping those who are responsible for their emissions to understand and change and reduce their own emissions. So, um, don't get me wrong, our data is available to everybody. It's for sale to anyone in the world. But our primary focus is on getting it to the operators and working in a collaborative way with the operators. That- that, to us, we think where we'll get, first of all, greatest revenue - we're a business after all - and also, the greatest impact.

Chad:
Yeah. Makes sense. Okay. So, what's coming up for you guys? I know you've got some product launches in the works. Um. Can you tell us- What can you tell us about that?

Stephane:
Right. So, the, uh, the- Two different kinds. So, first of all, there's the next satellite, of course, it's gonna now provide the next generation of our data, which is going to be bringing down our detection threshold by about a factor of ten, which means we'll see that many more types of emissions all around the world. So that's gonna be really exciting. And we actually have another satellite, right behind that one, that is gonna be launched in December 2020. And, um, those two combined are obviously gonna triple our capacities. We started at one, we're gonna be at three. Um. And then, you know, on that, we're currently raising a Series B that will allow us to grow to a constellation of ten satellites and have that by the end of 2022. So, very aggressive. And that is to provide both extra coverage and more revisits for key areas that where we know we can generate the most revenue. So, that's all in generating data. But that's just half the story. The other half of the story is analytics. So, here we work directly with customers ourselves, because we think it's really important to understand the value chain and what- what the insights are that customers need, so we can better tune our products for that. And we work with partners as well. So, partners who have, you know, very specific insights or very unique data sets themselves, which together, married with ours, can provide that much more insights for our customers that they're, you know, they're gonna be happy to pay a premium for. So, uh, those analytics start with something as simple as, um, automatic detection and quantification of emissions. That, believe me, that's non-trivial. That- that's- There's a whole raft of science around that in itself. But over and above that, there's then taking those patterns of emissions and seeing how they change and progress over time, and what are the root causes of those emissions. So, it might be, for example, that a significant portion of the emissions from oil and gas facilities are from known sources. You know the compressor stations that are going to emit, because they've got certain types of compressors that are designed to leak methane. But you really then want to find which ones are not supposed to emit, and those are the ones that should be prioritized in the maintenance dollars for the operators, and also, you know, either maintenance or CapEx dollars, because you need to fix or replace those.

Chad:
Right.

Stephane:
So, having an extra bit of insight, which is not just, "Show me concentrations per pixel." But, "Show me now, where are the emissions and what's the root cause of that emission, and how does that help in decisions and action for the customers?" That- that's the analytics bid. And we're making significant investments in that to really understand our- our use cases and our- our burn.

Chad:
And when are those, um, services gonna be rolling out?

Stephane:

We already have. So, we announced in January that we're selling the Bloomberg. And so, that's an example of a derivative product for the financial community, and that's been available since the beginning of February. Um. And we announced in Davos, that we're actually gonna provide a free global map of methane that is, uh, on a two-by-two kilometer grid globally. And that's meant to provide the latest information in a more timely way to the global community of policy makers and scientists. And then from there, if people want to know what the, you know, what's going on within each one of those two-by-two kilometer grid cells, well, you know, it's available for sale. So, we are rolling out analytics products like that, um, in a steady drumbeat. Already have and we'll be doing several more over the next six months to a year.

Chad:
Great. And so, how can listeners learn more about GHGSat? Just the website or- or...?

Stephane:
So, the website's the obvious place for sure. I'd encourage you also to follow us on LinkedIn or Twitter. Um. That's where we provide most of the timely updates on what it is that we're doing, and our new insights and information that we're finding. Certainly, if you want to keep up to date on what's going on in greenhouse gas emissions at industrial facility level, uh, we obviously pay a lot of attention to that, and we share that with everybody that follows us. So, encourage you to follow us there. And, beyond that, of course, please reach out to me or to anyone of my colleagues. You can find us on LinkedIn or, of course, there's always the good old info at GHGSat.com.

Chad:
That's great. And then, uh, one last question. So, on the show, we like to say that there's never been a better time to get involved in space investing. Can you give us your perspective on that and where, you know, you think the most exciting opportunities are?

Stephane:
[sighs] Um. Well, look, I come from a generation that, uh, I- I like to tell the younger people on my team that, um, when I started as an aerospace engineer many moons ago, I was really excited about being an entrepreneur. And I'll always remember my dad asking me, "Well, how much would you need to do something like that?" And I thought, "Hm. A hundred million dollars." [laughs]

Chad:
Yeah.

Stephane:
You know? Now you can put up a CubeSat and it's within reach of high schools. Right? And it's within reach of universities to do actually meaningful science, or even meaningful business, with CubeSats. And so, absolutely there's never been a more exciting time to be in the space business. This is what I had dreamed of as a young engineer and entrepreneur, wanting to be able to offer services from space to help the Earth. And here we are today, and I think we're just at the beginning of it. So, abso- I would encourage anybody who wants to get into this market to go for it. It's a very exciting time to be in space.

Chad:
Stephane, this was great. Thanks for coming on the show.

Stephane:
Alright. Thanks, Chad.

Chad:
Thanks for tuning into The Space Capital Podcast. If you enjoyed this episode, please leave us a review and subscribe to make sure you never miss an episode. And if you're interested in learning more about investing in space startups, I invite you to visit our website, SpaceCapital.com, where you can learn more about how you can get involved in this world changing innovation economy.