[AH 0:01]: My name is Alex Henderson and I'm the Needham optical networking and security analyst. It's a pleasure to have Poet here to do some fireside chat. We're going to be talking about the companies fundamentals and outlook and what's going on over the course of the next 40 minutes. … Welcome gentlemen.

Suresh as the Chairman and CEO maybe you can give us a brief introduction to Poet for people who are not familiar with the company. We've got a very broad audience. My guess is some of them know you but some of them probably don't.

[SV 1:08], Good morning, good afternoon, good evening, … depending on where in the world you are. That definitely applies to me. Its great to be here to talk to you about Poet, what we're doing, what we're about. So fundamentally at a very high level Poet is a photonics hybrid integration company. There are two major buzzwords in the industry today, especially in Europe. One is hybrid integration and the other is silicon nitride waveguides. Basically we do the combination of those two. We're a hybrid integration platform using a novel application of dielectric waveguides that assist in a seamless integration of electronics and photonics, and the assembly is done at wafer scale, testing is done at wafer scale. That provides the economies of scale as well as the size and form-factor and performance benefits to really any photonics sub-system that you want to design. Our primary approach to business development is to apply our technology to the kind of broadening field of data communications where we can provide subsystem level optical engines either with or without the electronics incorporated in it for a variety of different market applications. In data communications, we're currently deploying through qualification our 100G/200G optical engine that we have designed and developed for either CWDM or LR4 applications. The major value proposition for Poet really is form-factor, cost, architecture and then economies of scale associated with the ways we do our integration. Fundamentally we have an innovation that allows our customers to innovate. And that's what we're really all about. You know we provide capabilities to the customers that they haven't seen before, and they have an "A-ha" moment about how they might want to architect new products. We enable customers to innovate in this space. That's kind of what Poet's about.

[AH, 3:33] Let's talk about what an optical interposer is. Its not a term that I think most people are familiar with. Sounds very technical for most people. What exactly is an optical interposer and how exactly is it different from the approach that is more commonly used today?

[SV: 3:56] That's a great question and through a variety of different exercises I've been trying to simplify the message as to actually what it means and what it does. Let me see if I can play this out for the audience here. An interposer is anything that interposes between two mediums. So it basically is a means of communication. Hence the word interposer because we enable communications between individual components. Now why optical interposer? Because there is a term called interposer that is very widely used in the semiconductor industry. Its been in production since about 2015 and that's the electrical interposer. And the electrical interposer is basically just called "the interposer". Nobody says "electrical interposer". We have to qualify specifically to say optical. So an electrical interposer interposes between electrical chips. It enables electrical components to communicate with each other when they are placed in close proximity on the interposer. Examples of electrical interposer, such as graphics and memory. AMD does it and Nvidia does it. There is processor and memory. Intel does it. And they call it something else but its fundamentally an interposer. So there are various companies that as a consequence of needing high speed communications have migrated to this concept of an interposer to enable co-packaging or close proximity placements of electronic components. What Poet's been able to do is build upon this interposer concept and layer on, if you will, an optical medium that enables communications to occur optically. And when I say communications to occur optically, I mean guided optics through waveguides. What Poet's been able to do is to create 1 to 2 layers of optical connectivity in the interposer. So that allows a degree of functionality that we haven't really seen in the industry before. And what's particularly unique is that the electrical and optical interconnectivities don't interact with each other. So they can crisscross. There is a significant utilization of space, and our form factor benefits as a consequence of that. So that is what we call the optical interposer. Now how does it vary from..

[AH, 6:37] Just to be clear so it is both optical and electric interposer in a single use case.

[SV 6:44] That is correct. The optical because it has optical communication layers, interposer because it has electrical communication layers. That's kind of the genesis of the term we're using. Most, even at 400G today, most transceivers or data communication systems that are in vogue today are not necessarily guided optics. There's a lot of free-space optics that is part of the transceiver manufacturing that tends to result in expensive assembly equipment and capability, active alignment, lots of micro-optics with lenses and so on. They tend to be fairly discretized in term of how these modules are put together. So Poet is fundamentally a guided optics basis. So we do waveguides and waveguide based communications. We don't use thin film filters for muxes and demuxes we use arrayed waveguide gratings that are built into our waveguides. We use extremely high quality, very low loss dielectric waveguides which are currently in vogue. If you look at most of the publications coming out of Europe, people are talking about these kinds of waveguides. We've just been able to do it with an integration capability with electronics that nobody else has done so far.

That's the way we're different. What we can do with a single chip integration using the interposer, the form factor is about a factor of anywhere from 3 to 6 times smaller than what can absolutely conventionally be done with standard optics. In comparison to standard optics, there's a world of difference in terms of what Poet does because its wafer scale assembly and capabilities. Compared to silicon photonics, which is the other term that is broadly used, we are effectively also a form of silicon photonics, just like Rockley might say that they are a form of silicon photonics. We all do things differently using silicon as a medium. Poet's silicon photonics uses or develops an optical interposer, which is an assembly platform, or a hybrid integration platform, that enables active components to be integrated on it. We have the flexibility of which device we choose. We can use a silicon photonics conventional modulator, or an EML laser, or a DML laser. We could use any form of photodetector or even Lithium Niobate modulators. We do have a very broad flexibility in terms of what that [?] platform can do, which is great because once we develop all of the basics, fundamentals, and capabilities which we're doing today, the scalability and applicability of that platform into the future is just very seamless. We are able to use those same concepts and it doesn't matter whether it's a 200G per lambda Lithium Niobate modulator.. Yeah, bring it on. Because we have the platform with the CW lasers already incorporated and integrated in it. That's the flexibility that our platform or our approach to silicon photonics has, which is broad hybrid integration capable, not necessarily a form fit for a specific application. We do have that platform mentality which allows us to morph and track and adapt to a variety of different applications with what we're doing.

[AH, 10:36] The technology that you are describing, is a subassembly component that goes into a layer of a multi-layer device that is probably manufactured by somebody else. Is that a fair way to characterize it?

[SV, 10:54] So the optical interposer is itself a silicon wafer. It is designed by Poet. It's manufactured for us on a contract basis by Silterra, in Malaysia. Poet has consigned equipment that is proprietary to Poet in terms of the materials that it deposits and the materials that it etches and the materials that we measure. But at the end of the day what we get back [from Silterra] is an 8-inch silicon wafer that we then send for assembly. So our partner in China, Super Photonics, then gets this wafer. They assembly the components onto the wafer, test it, and once it's singulated it gets shipped out. We have also established assembly capabilities in Singapore. As of this coming month we will be turning that on. And so we will have the ability to do research and development in Singapore for novel applications with our platform while Super Photonics focuses on manufacturing and go to market.

[AH, 12:06] Just to be clear on the process here: so you put it through. You get a wafer. You slice and dice the wafer. Then it goes to assembly. The parts are being manufactured in China. But then its shipped to a contract manufacturer who's inserting it into modules that are going to somebody else's transceivers?

[SV, 12:37] Our initial customers are transceiver module companies. So there is no CM [contract manufacturer]. We're basically performing the task of a traditional CM. I mean if you look at most of the transceivers that are built today there will be a component like a laser which goes into a manufacturer who makes it into a TOSA or a Transmit Optical Sub-Assembly or a Receive Optical Sub-Assembly. Those then go to a CM. Then it goes to a transceiver module maker. What we do when we finish up assembly of our optical engine, it basically supplants the TOSA and the ROSA. It is a combined TOSA/ROSA into a single chip that then goes directly to the module maker. It's a chip on-board assembly for a transceiver.

[AH, 13:14] So the end market here at the end of the day is probably the scaled out data center environments for the most part. Is that a fair statement?

[SV: 13:50] That's where we are starting. It's scaled out data centers and telecom to a certain extent, because a lot of interest in the 100G and 200G LR4 is for the telecom space. I mean it's the client side which does [?] into the datacom. What we're also seeing is a lot of interest in exoscale computing. We do have projects and programs associated with providing highly integrated laser solutions for AI, for example. And there is also a lot of interest with regards to exoscale computing as it relates to CPO or co-packaged optics. So we're kind of seeing the conventional players interested in our platform for what it provides in the 100/200/400 and then we're seeing the hyperscalers and the server compute guys interested in looking at what we're doing for the co-packaged optics space which is quite exciting.

[AH, 15;00] So before we go down the curve of whose doing what with the product, can you talk about the dynamics around cost, the dynamics around performance, the amount of savings around the electrical envelope, the lossiness elements… the key parameters of why somebody chooses to use this technology versus alternative technologies.

[SV, 15:31] The biggest drivers to cost in conventional manufacturing is the time it takes to put some of these assemblies together and the testing that has to be done, and the various test insert points that have to be put in place. And then of course there's no economies of scale. It's a linear cost relationship. You put 10 people on 10 stations and then you start making these things one at a time. I mean the fundamental dynamics of cost are converting that into wafer scale capability and assembly. I mean we've spent the past two years now demystifing this concept, that photonics can actually be assembled at wafer scale just like electronics and that's what we're doing and that's our vision. So the cost is anywhere from 30% to 50% lower, depending on which application you go after. Of course the higher end applications you see a much better cost benefit. LR4 you see a huge cost benefit because of how difficult standard LR4 modules are to make. CDWM-4 not as much because that price has come down. But even there we can demonstrate up to a 30% cost benefit because of what we do. That's one vector. The other vector we measure ourselves on is performance. And you would say "Hey, 100G is 100G. Who cares, right?" (AH: "I wouldn't say that!") What we've been able to demonstrate with our 100G systems is eye margins over 40%, where most other companies 100G systems will have eye margins around 25%. I mean they would consider that to be very good. We are consistently over 35% to 40% depending on the temperature. So the RF capability of our interposer is so clean because we completely eliminate the wire bonds. So even at extremely low power levels, we can create wide open eyes.

[AH, 17:47] For people who don't know what a wide open eye is that means the signal that's going through the product is very clean and does not have any distortion in it.

[SV, 17:58] That's correct. [With a wide open eye] you can't confuse between a 1 and a 0 in a digital state. Not only that. Because of that, we've been able to operate these at up to 30% lower power because we can drop the currents down, we can drop the power down, and still get very good transmission. It's cost. It's performance. And then finally scale. I mean we do everything at wafer scale. Our interposer at the end of the day is a very advanced submount. But practically its like a submount. And that economy of scale is quite staggering compared to what others conventionally have been able to do. One thing that I would point out, is that because we do use the novel dielectric waveguides in our interposer, we are able to integrate the entire subsystem that includes transmit and receive. That has been a challenge for silicon photonics, silicon photonics in its conventional state. Its most successful implementations have been in parallel optics, like PSM-4 or DR4. You see very little, I think outside of Intel, you see very little CWDM-4 or FR4 coming out of the silicon photonics guys. And that's because the demux of the receive chain on silicon photonics has always been challenged. Even Intel CWDM-4 does not use… I mean it uses external optics to do the demux function after 15 years of R&D. I think that's one area where we do bring a significant advantage, it's that our value proposition and our cost equation in the FR4 domain where you basically have wavelength division multiplexing, or different wavelengths of light being used to transmit information, we shine in those kinds of applications for sure.

[AH, 20:00] My guess is that 90% of the people that are listening to this have no idea what your talking about. So maybe we should move on a little bit, because your getting very technical. I want to address a couple of questions here. One is where are we on the manufacturing front. Particularly where are you with the Sanan IC JV, which I think is a major piece of the puzzle?

[SV, 20:31] We're scaling up the joint venture. I think the investment thesis is sound. We're working with our partners to qualify the first set of products which are our 100/200G dual purpose engines. So these are basically a single engine servicing either 100G or 200G depending on what the customer wants. We've got our first set of customers lined up for that. We're going through beta. So this quarter, we're going through our beta builds. And then eventually qualification, and then production. So we're still going to be in production in second half of this year just like we'd mentioned earlier.

[AH, 21:20] So when you move from qualification process and beta builds to production, that will produce product that is then ready to be integrated into other people's transceivers. Is there another qualification of their product after they've integrated it. Hence the demand pull for the product is beyond that?

[SV, 21:46] It depends on the level of engagement and the timelines of the engagement. So with some of the customers, they are already starting to do their module design and their validation with our alpha samples that have been provided to them. In that case, there is some degree of concurrent engineering. For the customers that are waiting for the product to be kind of beta or production ready, prior to them even engaging, then there will be an additional cycle of them actually engineering the product and going to qualification. So it depends on the customer. Some of the early customers that we have announced that are kind of jumping in up front to co-engineer and co-design will obviously be out the gates faster than others.

[TM, 22:49] I just wanted to say, one of the areas that's not too technical that Suresh didn't address is the form factors. The 100G optical engines that are produced are very small. They are 300mm x 600mm, which allows us in some cases to put two to four individual engines within one form factor of a module, where it fits in the space that others can only place one. What that has opened up are some very novel applications that our customers are interested in architecting with us.

[AH, 23:42] Great point. Going back to the [?] between customers that are going to pre-designing and customers that are going to post design, what is the scale of the demand that is associated with the pre-design customers that will come in the first tranche?

[SV, 24:05] As you might expect, there's the incumbent guys that basically have tooled up their manufacturing a certain way and they will only be looking at us for next generation stuff, because they've already tooled up for 100G. There are customers we are talking to that are wanting to invest in this capability but don't want to invest in the conventional way of doing things. So they are the ones who are keen on designing us in right away so that their investment is based off of a platform that has legs that can go into the future. So we've got a couple of those that we are working with in that mode. The second tier guys, we've already sampled a few of those and there's an expression of interest from one that we're working with closely. That's on the 100/200G. And then on 400G, the markets far more open and we're working aggressively to get our 400G solutions proven out and validated. One of the really important points that we're starting to talk about a lot now is we've got an extremely robust DML platform. So we've been doing this now for a couple of years with the DMLs. We're the only ones in the world that flip-chip assembled DML lasers into chip scale optical engines. There's nobody else that does that. Now conceptually there are companies that you know that are starting to sample 56G DML lasers vs. 28G DML lasers, so we're talking to them about incorporating their DML lasers with our highly integrated, well proven, 100G/200G optical engine. Because the optical engine is the same. It is speed agnostic. The same engine will work 100/200/400. The optic components, the laser and the PD will be different, but that's it. And so we believe that we will likely have an extremely competitive 400G engine that most people will not be able to touch in terms of form factor and cost. That scalability is critically important to understand, especially given our investment. So it's not like a one and done "Oh my God we've done all this work on 100G DML and its over". You know DML lasers have consistently, eventually become the de facto for the lasers. I mean it happened at 10G, it happened at 28G and its going to happen again at 56G. Once that happens, an 800G becomes a no brainer. Its 2 x 400G and our form factor is so small that two of them would fit into a QFSP-DD. That's kind of our roadmap, complete the

100/200 and then really 400/800 becomes a seamless transition to us between the two. And we are working to get our DML platforms as quickly into the 400G arena as possible.

[AH, 27:47] Can we go back to the Sanan JV? Why is it critical that you're going that route you know partnering with a Chinese firm to do this as opposed to doing it yourself? Do you have other manufacturing partners or alternative production partners for that JV?

[SV, 28:19] Well the reason we set the JV up initially is that in the cost competitive space like 100/200 you don't want to have margin stacking. And in this particular case we have a source of components like PDs [photodiodes] and lasers and MPDs [monitoring photo diodes?] and so on and so forth, directly from Sanan. The interposers go from Poet and then SPX virtual IDM [integrated device manufacturer] model effectively can build these engines at extremely low cost and scale. So that is the premise of the JV. And the JV is 100/200G worldwide in terms of their ability to sell, and 400G inside of China. Poet sells 400G outside of China. And then all the other applications that we're going after including some of the light sources for exoscale computing and 800G. We do have assembly capability now both inside of Poet in Singapore as well as at the JV. And I think the JV will be focused on ramping and production. Poet will be focused on new products, new applications as well as new product introduction. You know yield enhancement and things of that nature that we would need to transfer knowledge to our JV with. So our JV was originally set up for that purpose. Do we have an alternate capability to do it internally? Yes we do. We've kind of established that line and capability now in Singapore. Our first tools are going to be installed this month. Covid is obviously putting a big damper on that since travel from Europe, Singapore, and other places is hell. But over the course of the next month as things ease up, we will be installing and releasing that capability. So we do have kind of a dual purpose capability. One in China and one in Singapore as well.

[AH, 30:15] Has there been any supply chain challenges to get this project ramped, or is it more under your control? I've heard all kinds of horror stories around the availability of a variety of things, but particularly the raw substrates and the like.

[SV, 30:40] So raw substrates we planned ahead and placed orders ahead of time. Believe it or not we have to order, to place orders for ingots, which is the base crystal. We're not placing orders for substrates. But anyway, it's been an issue. And its really starting to impact us… I mean one of our subcontractors that does a critical piece of the process for us, their equipment's pump is broken down. Between supply chain issues and covid they can't get anybody in for weeks to repair it. Were seeing that. We're seeing real slowdown in production in Germany, which is a critical piece of… some of the critical tools that we need for assembly comes from Germany. So that's been a challenge. We're seeing it in spades, everywhere we turn. We try our best to overcome it.

[AH, 31:42] So what do you think is going to happen relative to this omicron stuff. I mean this zero tolerance policy seems extremely challenging to persist. Does that cause any risk to your business if that were to come to a city near you?

[SV, 32:00] Oh Yeah. We're seeing it today. Our assembly equipment shipped from Germany to Singapore in the first week of January, but we can't get anybody from Germany to Singapore until the end of January because Singapore is shut down. So we've got a month delay just because we can't get personnel moving across countries.

[AH, 32:26] I was really talking more about the Sanan JV in China.

[SV, 32:30] That one has been a real challenge. I mean we started the JV process in fact Tom and I were there when covid broke out. We were there in December of 2019. We've had to manage this JV remote control. JVs are art. They are the meeting of minds of two companies. Technical is one thing, relationship is another. Establishing the right relationship rapport is very critical to the JV and we've had to do it all remote. The entire hiring had to be done remote for the JV team. The transfer of knowledge had to be done remote. It has not been easy. And for a small company like ours, we've had to go through that and it's a lot of hours on the phone at odd hours of the day and night to get this done. But, thankfully we've got the right people with the right attitude. I would say that's one of our big strengths. Technology is one, people is the other. And we've had the dedicated people to do it and we've made the progress that we've made, and we continue to make progress. But, everything is slowed down. Decision making is slowed down. It's much easier to win deals when your in front, eye-to-eye contact with somebody. Clinching something like that is much harder to do on Zoom. These kind of things do affect us as a business.

[AH, 34:10] Can we talk a little bit about the sales channel process. This tends to be an engineer-to-engineer sales kind of process I would think. That's not an easy exercise particularly in the world we are in today. Have you been able to do that reasonably well from a remote format?

[SV, 34:32] It's been tough. To the extent that most of our initial target list of customers is in China we've been able to get the right people from our office in Shenzhen in their offices and having the right dialogues. I think that's worked out well. In North America it's been largely remote. We are making progress. We have meetings all the time. There are a lot of follow-ups, and we do that. But as you know what we are selling is not a standard product. You can't do a channel sale on it. The sales channels are in fact established almost on a company-by-company basis. There is no channel that can sell an optical engine into a… unless we make our own modules.

[AH, 35:30] Thomas can you give us a sense of where you are in terms of making the transition from the Toronto exchange to the Nasdaq. Maybe a little bit of where you are in terms of your financial structure. Clearly we haven't talked about revenues, margins, balance sheet, and cash flow at all. Maybe a little background on that would be helpful in the five minutes we have left.

[TM, 35:57] We are not in a position to talk much about revenues because we're at relatively low revenues and in some cases no revenue. Most of our revenue that we have recognized has to do with NRE. But we can judge what we think our gross margins are going to be by the samples that we are producing. So we are focused mainly, as many companies are, on the expense side. In early November we reported to shareholders that we had $24 million on our balance sheet, and since we burn about $1 million a month in cash. That would suggest that we've got 2 years of cash available.

[AH, 36:50] Does the step up of building inventory and building product accelerate that?

[TM, 36:56] On the product side we are not that concerned because the product side inventory is going to be handled mainly by the joint venture, into which by the way we've not really put any cash… into that. Our JV partner is handling all of the Capex and all of the Opex associated with the JV. What I think we are looking at though is, as we expand into other vertical markets… we've talked recently about the wearables market for example, and our ability to develop and design a spectrometer that's built into our optical interposer platform. As Suresh just mentioned, the question about whether we should be producing optical engines or we should be producing modules. So as we look at those kinds of moves, that's going to require capital. We have been saying that we would consider doing a Nasdaq listing for example in connection with a public offering. I think our view now is that we may be better off getting on the Nasdaq as quickly as possible, and saving the capital raise for a later date, since we are not today in need of cash. And, of course, we would never wait until we were absolutely in need of cash.

[AH, 38:38] I would concur with that. Listing on the Nasdaq would probably give your stock a lift, and that in turn would make the raising of capital less expensive.

[TM, 38:47] Absolutely. And so, we've had a subcommittee of the board appointed. We've had some meetings and that, and some discussions around that, and I think we can say that we are committed to doing the Nasdaq listing as quickly as possible. Because as we look at the landscape and our market cap… I mean we really do believe that one of the biggest challenges in the company for our share price is the fact that we are on the Venture exchange and the OTC in the Unites States.

[AH, 39:18] What are the steps that need to be taken to complete the timetable to getting onto the Nasdaq listing? I think you've said in the past that you hoped to do it in Q1, but it might slide into Q2. Any thoughts on what needs to be done in between now and then?

[TM, 39:35] I think in terms of the listing itself, I'm pretty confident we can get that done in Q1. And it's really at this point just mechanics. We need to go through a consolidation of our shares because we've got a lot of shares outstanding at a low price, so we are going to do that. And that has its own mechanics associated with it as far as the Venture exchange is concerned. And our Nasdaq application which has kind of been on hold for a few months, we are now refreshing the documentation and providing responses to the Nasdaq inquiries, and that's moving along. I really think that timetable is 2 to 4 weeks… in that range in terms of getting through those mechanics. And so, when that is finally decided we will make those dates and those timeframes, or at least a part of the timeframes, available to shareholders.

[AH] ending remarks and good-byes