

## Main Engine Cut Off Podcast

Transcript

Air Date: June 23, 2021

Redwire participants: Andrew Rush and Matt LaPointe

Anthony Colangelo: Hello and welcome to Main Engine Cut Off. I am Anthony Colangelo. Today we are going to talk about the newest upgrade to the ISS, the rollout solar arrays that are in the process of being deployed. It's going to be six different wings deployed on the ISS. The first one is deployed now. The second one is kind of halfway there, given some EVA scheduling that we will talk about in this show. The rollout solar array upgrades to the ISS were something that took some of us by surprise early in the year. It was kind of under the radar for a while and then NASA posted a press release that said we are flying six new solar arrays to the space station this year. And they are really really cool pieces of technology. They are, as the name implies, they roll out so they are all rolled up when they get launched and then they get put in place when they deploy under some really interesting mechanisms that require no motors or anything like that; no moving parts, just unfurling with its own support structure.

So I wanted to talk to a couple different people from Redwire. Redwire is a company that holds a couple other companies that you may or may not have heard of: Made in Space and Deployable Space Systems among others. Those two just pertinent to the conversation today. First, we are going to be talking to Matt LaPointe, who is the technical director for the rollout solar array program, formerly at Deployable Space Systems, I guess still at Deployable Space Systems, as part of Redwire. And then we are going to talk to Andrew Rush. You may remember his name because he was on the podcast almost two years ago when he was at the time the CEO of Made In Space. Made In Space became part of Redwire and Andrew Rush moved to be COO of Redwire, the parent company. So he's coming back on the show to talk about some of the future-looking aspects to the rollout solar array program. There's a lot of missions that are going to be using this in the near future and I want to talk a little bit about Redwire's general strategy, because they are kind of the experts with deployable or in space assembly systems in space today. So I want to talk about, you know, everything from the technical background of the rollout solar array program through the what does this mean for Redwire overall. And I think we've got the two perfect guests to do that. So that's what we are doing here today.

But before we get into talking to Matt, I want to say thank you to all of you out there who made this episode of Main Engine Cut Off possible. There are 658 supporters of Main Engine Cut Off every single month and that includes 41 executive producers. Thank you to Brandon, Matthew, Simon, Lauren, Melissa, Kris, Pat, Matt, Jorge, Ryan, Donald, Lee, Chris, Warren, Bob, Russell, Moritz, Joel, Jan, Grant, David, Joonas, Robb, Tim Dodd (the Everyday Astronaut), Frank, Julian and Lars from Agile Space, Tommy, Matt, The Astrogators at SEE, Chris, Aegis Trade Law, Fred and seven anonymous executive producers. Thank you for making this show possible. If you want to help support the show, head over to [mainenginecutoff.com/support](http://mainenginecutoff.com/support) and join the crew there. You can get an entire other podcast in your feed every week called MECO Headlines where I talk about all of the stories going on in space. It's a great way to stay up with news and support the podcast. But now that we have thanked all of you, let's get into our conversation with Matt.

---

Matt thank you so much for joining me here on Main Engine Cut Off. It's a pleasure to have you, and I am sure a very exciting week as everything... I guess we are still mid-deployment of the solar arrays that are up on station. And so how has your week been going with all this happening?

Matt LaPointe: Yeah thanks for having me. It's a really exciting time here. We have one of two down so we are looking forward to Friday for wing number two deployment. Definitely a lot of buzz and excitement. We can't wait for the second wing to be deployed and start producing power.

Anthony Colangelo: It was an interesting time because ISS EVAs tend to go relatively without any issues and then they are always like "Oh we are ahead of schedule, we're doing like nine other tests." The first EVA they had some suit issues. I think I was traveling during the second EVA. Was there also somethings that were getting worked during the second?

Matt LaPointe: Yeah, unfortunately Shane's suit had a couple issues on both the EVAs. They also had a little trouble with the thermal cover that goes over the hatch. So, yeah that definitely set us back a little bit on the first EVA. And unfortunately, they ended up having to cut it early before they could get through the full installation. So yeah you know things happen. It's never easy with human space flight, there's always challenges that may come up. And Thomas and Shane, they did an amazing job on these EVAs, overcame all these challenges to make that deployment happen. So we couldn't be more happy. And you know, we are hoping this third EVA everything goes according to plan and no more suit issues hopefully for Shane.

Anthony Colangelo: Yeah exactly. So I wanted to talk a little bit about the historical context for the work that's happening this year, because I, and I don't think I was unique in this, I was surprised in January when NASA put up this press release that they were upgrading the solar arrays in station. I don't think many people knew about it, because I sensed a lot of surprise from many people in the industry as well that I was talking to about that at the time. And I know you had a demo mission back in 2017 of the smaller scale rollout solar array that I assume led into the upgrades that are going on in station this year. So could you give us some context on the program overall to this point and how it got to this level of like now we are going to upgrade six of the eight wings on station? How did that all come about?

Matt LaPointe: Yeah definitely. So, so ROSA as a product line, we've been developing for a little over a decade now. We were Deployable Space Systems, now we're part of the Redwire team. ROSA kinda came about as a, you know, funded by the SBAR small business programs to develop new technology, which was from a lot support from the Air Force research lab early on and NASA. Coming up with a new, you know there is always this desire to have a new high-performance solar array design, so we spent a lot of time with these kind of smaller programs developing the technology and kind of taking that big step of getting it used into the market over these past ten years or so. And we were fortunate enough to get funding from Air Force Research Lab, NASA, SMC to do this experiment demonstration mission on ISS back in 2017. And that was the first chance we had to really showcase the technology on orbit for the general public we have been doing a lot of work on that point with various customers, both commercial and government, developing ROSA for different applications. And right around that time we did that demonstration mission, working with Boeing and NASA, there was definitely this desire to – or a need I'll say to increase the power on ISS. They were realizing the current arrays up there now were degrading a little bit faster than they had anticipated so Boeing announced they saw need to do – add more additional power capabilities to extend the life of the existing systems up there but also enable any sort of future missions and, you know, prolong the life of Space Station.

---

Right around that time in 2017, we began developing this program with Boeing and, yeah, it was a little under the radar for a while, just with everything going on with ISS and, you know, I think there was a kind of a desire to keep it low key until we got further along in the design and development process. And then yeah, you know, we produced the first two wings and delivered them and here we are today. We have the first two up on orbit and currently working on wings three and four that are gonna be delivered later this year and five and six will shortly follow after that.

Anthony Colangelo: I am curious about the interaction there about the ISS program and your demonstration mission. You know you did this on ISS the first time. Did you have an idea at the time that this would be a good upgrade for the ISS or, you know, the long list of missions that ROSA is going to be used on? I think that was pretty lengthy at the time as well that you had your eyes on certain missions and I don't know if the ISS was on there, but I guess what I am getting at is what is the fit of the ISS for the actual technical aspects of ROSA? Did that feel like a good match from day one?

Matt LaPointe: Yeah you know, for us ROSA I think would be, it kind of was this perfect technology if you were going to add more power to ISS. It's a very, the way it deploys and how we could package it in the launch vehicles, it just to us seemed like a perfect fit. So, when NASA and Boeing first started expressing interest about using it, you know, it was kind of around all that same time frame so it was, definitely that flight experiment was a big kind of push and they definitely saw the benefits of using ROSA and what it could do for upgrading the station. So yeah it was all kind of a great combination of things that all happened around that time frame and we were fortunate enough that NASA was looking for a solution and you know ROSA was really a perfect fit for what they needed.

Anthony Colangelo: Was the stowage part that you mentioned there, that the ability for this to be packed a lot smaller from my understanding than competing designs and things like that, that seems like a pretty big motivation because of the constraints that NASA is dealing with unpressurized cargo to ISS. If it can fit in the dragon trunk, you are good to go. Otherwise I don't even know, you'd have to make a new space ship to get to ISS with something much more sizeable. So, it certainly looked like you were maxing out the trunk area of dragon.

Matt LaPointe: Yeah, yeah.

Anthony Colangelo: Was that a design constraint early on that you knew that was the package you have to fit into?

Matt LaPointe: Yeah, no. That was, that was definitely one of the key design drivers was being able to fit in the dragon. Yeah you are absolutely right, without... the space shuttle allowed for a lot larger payloads of things to fly and so with that no longer an option it is definitely, space is definitely the constraint we have to work around. So... we maxed out as much volume as we could in the dragon trunk. We were down to the last quarter of an inch or so of what we were allowed to, so we really packed in as much as we could to meet that power requirement that Boeing and NASA were looking for. And yeah luckily with the ROSA design, we have a lot of different options with what we can do with the design. The iROSA wings that were flying on ISS, those were our folded ROSA design. So we do have other applications, like the flight experiment is one example where that array didn't fold. We didn't have that need to fit it in a small envelope, but yeah we have a lot of different options for packaging and the arrays that are going to be flying for the lunar gateway are propulsion element. Those are going to be a folded ROSA design on their launch vehicle. So if you – if customers are looking for big power, that is a good way to package a lot in a small area.

---

Anthony Colangelo: Now the cells themselves that are on these, I think I saw some references to your site that it was a, was it Boeing, that actually makes the cells themselves on the solar arrays and you are more focused on the deployment system? Is that kind of the breakdown of the system?

Matt LaPointe: Yeah, so us here at Redwire, we don't actually produce the solar cells themselves. So we, we basically procure the cells from a handful of suppliers. So for iROSA we were using cells from a company Spectrolab who is a subsidiary of Boeing. And they're one of two or three key suppliers of solar cells for space. And they have a cell that packages really nice from what we wanted to include on ROSA. But the really nice thing about the ROSA technology is we can really incorporate any cell technology that is out there and it's a flexible platform – we can do different cells and also different concentrator technology. That is something we are trying to infuse back into the industry is the use of concentrators which all you to use less solar cells, because you're using the cells more efficiently. That's something we can incorporate onto ROSA. So yeah we are not in the business of making the solar cells themselves. We will use whatever the customers want and we're flexible in that regard.

Anthony Colangelo: Yeah and it makes sense for the work that you do, right. You want to make that end of the product offering open, because then other people can be making innovations in that area but you are still focused on being the best deployment mechanism you can be for any given solar panel so it's like a very clear mindset. One of the things that is interesting about the ISS usage is that it is getting deployed over top of the existing solar wings. And I believe this is to take advantage of some of the infrastructure that is already there with those solar wings with that tracking and I'm not sure exactly what else but I'd like to dig in a little bit.

Matt LaPointe: Yeah I know.

Anthony Colangelo: Why did that decision get made that way? Why still have those solar wings attached? Some people might look at that and say let's get rid of these things, you'll save some propellant when you need to do a reboost.

Matt LaPointe: Yeah, yeah

Anthony Colangelo: What is that breakdown there?

Matt LaPointe: So, it's... if you look at a picture of how we are overlaying it's pretty clear that we are only covering up about a third or so of the original arrays. And we're actually not, they didn't just unplug the original ones and plug us in. We're actually kinda spliced in. Boeing created kinda a y-connector where one end plugs into the legacy arrays and one end plugs into ours so they combine the power sources together so, you know, about two thirds of the original arrays are still producing power and they do still produce quite a bit of power even though the efficiency is a lot lower than it was in the past. So you know there was no need for to get rid of those if they are still producing power, just not to the level that NASA needed them to, to support another 10 or 20 years or so. But yeah, then the existing structure too we were able to utilize that for mounting our arrays and deploying. It would have been a pretty significant challenge to try to get rid of those original arrays and not have them up there anymore. So it definitely was a smart choice to pick a design like ROSA where we could just deploy right in front of those existing arrays, let them stay in place, then keep producing power as long as they can. You can tell, just looking at astronauts next to the original arrays how incredibly large they are and it would be quite an undertaking to try to get rid of those.

---

Anthony Colangelo: Not as easy as when they go out on EVAs and throw stuff overboard.

Matt LaPointe: Yeah, yeah

Anthony Colangelo: It wouldn't quite be the same.

Matt LaPointe: It would be quite a challenge.

Anthony Colangelo: I notice that the new arrays are mounted about ten degrees tilted up above the original wings. Is there, are there like thermal reasons for that or are there more of trying to get as close to flat as possible while still maintaining space to deploy? Or what's the design decision there that's driving that.

Matt LaPointe: Yeah... it's to maintain clearance between the two arrays. You know, as different vehicles come to ISS, you know dragon, Cygnus vehicles, they can impart plume loads from their thrusters onto the arrays. So we had to be sure that there is no chance that our arrays could like sway and hit the existing legacy arrays. So you know, we worked with Boeing and they came up with this kind of slanting angle that is a good compromise between not losing power from the solar cell angle while giving us a ton of clearance from the original arrays to make sure that they wouldn't contact or anything like that.

Anthony Colangelo: Can we talk about the booms themselves that deployed these arrays? That seems like the special sauce there that these are, you know, stowed in kind of a position that has a lot of tension on them but then when you release that it unfurls under its own power. What it is that is doing that, the actual unfurling itself?

Matt LaPointe: So yeah the booms they're, they're technical name is a slit tube thin wall composite boom, so if you think of a drinking straw and you were to cut a slit down the entire length of that straw and then flatten out the end and kind of roll it up into a tube, it kind of naturally is going to want to spring back out into that original tube shape. So that's kind of the fundamental concept of those booms. And it is something that they have been around for a long time, these slit tube composite booms in different form factors and is something that kind of led to the original idea of ROSA is, you know, Air Force had a lot of these, a lot of development they had done with these booms and they were looking for ways to turn them into real applications. And so along we came and said we can make a solar array out of these things. And yeah we've done a lot of development through the years. They're, on their own they're, you know, if you don't control them in the right way, there is a lot of stored strained energy in those things so when you flatten out and roll these booms they really want to spring out. So we have done a lot of development in figuring out a really simple, kind of elegant way to control that and turn it into a way we can deploy the array. And the really nice thing about it is that we are kind of getting a dual use out of them where they're basically kinda like the springs that deploy the array, but they also turn into our structure. So we don't need any extra things like motors that lot of other competing technologies, they require motors to deploy. We don't need that. We only need, we have some dampers that slow things down, but it's a passive device. It doesn't require any electronics or complicated things like that. So yeah it's kind of a really elegant way to get a dual purpose out of our structure and yeah they are really simple if you see one in person. They are like a tube with thin carbon fiber. Of course there is a lot more that goes into it as far as properties and what we do to make it work for us, but yeah they're definitely unique and we have a lot of different applications too that we use them for other things, like antennas. Not just solar arrays too. We've done a lot of different things with those.

---

Anthony Colangelo: So now that we've got, we've seen how the actual installation of one of these goes. We've got some experience watching these two EVAs that have happened, what is the rest of the early operations for each array on station? Is there more to it than that or is it really getting that install, getting it deployed successfully and then you kind of sit back and let it generate power?

Matt LaPointe: Yep that's pretty much it. So wing one, it's deployed, it's producing power. We, the telemetry's saying we're actually producing more power than they had expected so yeah everything is looking great. You know, we even saw as we were deploying, you could see the power curve. The power starting to increase as it was deploying further and further out. So that was kind of cool way to track along the deployment as it was going in real time. So yeah wing one is done, it's up there, it's ready. It's producing power as we speak. So, once wing two is up there, that will complete this first ship set.

Anthony Colangelo: Maybe to finish off our little technical discussion here, is there a story you can share of a moment that got very harrowing in the development of these wings? Is there something that happened that you didn't expect that there was some lessons learned from or did this feel like, given you had just done the demonstration mission before this and you are working on all these other areas, was this as easy as this appears from the outside to all of us looking in?

Matt LaPointe: Well, you it's like I've said, we've been around for a little over ten years or so. When I started originally at DSS, I was employee number five and we were just this tiny small group. A lot of us came from bigger companies, so we had, we definitely had the experience, but we kind of came into this as a small engineering group kind of figuring it out as we go. And to go from that to building the largest solar arrays that are currently in production, there was a lot of growing pains as a company to get to that point and you know we are lucky, we have an amazing team here and we have an amazing customer in Boeing that really helped us navigate all of these intricacies of working with ISS. So yeah, there was, ISS and human space flight in general is a lot more challenging than just a satellite. You have all the safety concerns. A lot more eyes looking at what you are doing to make sure that everything is safe for the astronauts, it's going to perform like you are expecting it to. So all along, we just faced these engineering challenges we had to overcome, and of course, building something this big without this existing infrastructure in place, there was, you know, a lot of development that went into just putting together the fixturing we need to make this and you know our team here just did an amazing job figuring it out and putting it all together. And I think we developed an amazing product and we are excited about all these future applications that are coming up and looking forward to using ROSA in as many applications as we can.

Anthony Colangelo: Yeah, it's probably, it sounds like the EVA incidents have been the most harrowing of all. You know, I just got, you just get nervous when things go a little south with EVAs because, like I said up front, it usually doesn't happen. Everything seems to be very very ironed out on these operations and so it was a couple of moments there where you were like well this isn't great that this is happening on these very important EVAs. But you got it back on the books for this week. So, it looks like its not going to delay things too much.

---

Matt LaPointe: So Thomas said, I think it was Thomas that said that this was like one of the most complicated EVAs he's done just as far as all the maneuvering. You are working with this solar array with these really delicate solar cells so there is that extra challenge where they can't just throw this thing around. They've got to be very careful with what they do. Everything has to be pre-planned and you know they do – we do the best we can to give them the training and the tools and procedures but ultimately there's always, with EVAs and things like this where it's not a really well defined interface and what we're doing, it – there's definitely some challenges to overcome. So, you know, it was definitely a sigh of relief getting wing one done and now we have seen how it goes and the work flow and we're hoping these next five wings are – just go very smooth, cause we have the procedures ironed out and they know what they need to do. We are really looking forward to Friday and seeing that second wing up there.

Anthony Colangelo: Awesome Matt. Well that's all I've got on the list for the technical side of things so thanks for coming on and talking through some of that. I am sure people are interested to learn about this after keeping their eyes on the ISS all week. So thanks again for joining me here.

Matt LaPointe: Yeah, no problem.

Anthony Colangelo: Andrew, welcome back to Main Engine Cut Off. It has been almost two years, I think, since we have talked to you last. So welcome back.

Andrew Rush: Thanks Anthony. Really, really glad to be here.

Anthony Colangelo: Last time you were CEO of Made In Space, so many things have changed in the two years since that. Redwire has, I was just looking at the timeline right before you hopped on, so I could remember how things played out. I didn't realize we're like almost the exact year anniversary of Redwire existing at all and everything has happened. So all the different acquisitions, and then announcing that you will be listed publicly pretty soon. I'd love to hear from you to start, just some general Redwire takes on where things are at, how all of these different companies work together and what you have been working on as COO day to day.

Andrew Rush: Yeah, yeah no absolutely. Thanks for that question Anthony. You know, so at Redwire we are really focusing on accelerating humanity's expansion into space. And the way that we are doing that is by bringing together some really talented folks from our legacy acquisitions, our legacy businesses, and integrating into just one really amazing company in Redwire Space to be a trusted mission partner to all the folks, whether, across the sector, whether they're focusing on civil space missions or commercial space missions or national security applications. And we're here to really help those folks be successful via our strategic focus areas. And those strategic focus areas are unsurprisingly areas that reflect many of the focuses that our legacy businesses you know were really specialists in. Those include LEO commercialization, on-orbit servicing, assembly, and manufacturing of satellites, digital engineering, large deployed structures and solar power generation as well as space domain awareness and resiliency. So we have a really wide variety of products and services and capabilities that we can bring to bear to make this second golden age of space that I believe we in really, really be sustained and realize its potential.

---

Anthony Colangelo: The acquisition pattern was very rapid. All these different announcements hitting one after another and it seemed like there was a very specific goal up front of which companies made sense to fit together. Was that as plotted out as it seemed based on the calendar?

Andrew Rush: So there are really just amazing companies throughout our sector that Redwire as a platform enables to kind of go to the next level. That as a smaller independent company in a sector that is kind of shaped like a barbell with a lot of small companies and there's a few gargantuan companies, it can often be challenging to scale. I mean it's challenging to scale in any sector, but in space in particular where, you know, flight heritage is king and you know having the insights in the marketplace are paramount. That scaling can sometimes be difficult, but we provide, I think we've shown and we've gotten this feedback from the folks that joined the cause here at Redwire, we provide this really great platform that helps folks really realize the potential of their capabilities, realize the potential of their technology and that's been a great attractor. And certainly, we have, we've been thoughtful about the companies we've brought together. We've definitely looked at a lot more companies than we – then have joined the cause, and we really, we appreciate anybody who kind of talks to us on that, but and being selective, that has enabled us to build a really strong company from a technical perspective, but also from a cultural perspective. You know, we really look for folks that kind of have a commonality of vision, that their companies have a demonstrated track record that is additive to our organization.

Anthony Colangelo: You seem to have become by way of gathering a lot of talent the experts in deployable, in space assembly. That area seems to be dominated by Redwire. The last time we talked it was right after Archinaut One was announced and Made In Space had won that contract. And we are talking now right after the first of the ROSA arrays have been, I guess that's like ATM machine, ROSA arrays, have been deployed on the ISS. And I feel like that book ends things pretty well. From your perspective as, I know that was an interest of yours from a long-standing time, the state of deployable structures and in space assembly, what is that like today and has that, has your vision for that changed now that you are running a company like Redwire that has all these different capabilities at its disposal?

Andrew Rush: At the end of the day, the market need has not changed. The market need is putting more capability on orbit per dollar per unit mass per unit volume. And the ROSA technology is just a supremely capable technology that shows how we can do that. Shows how we can put more watts per kilogram on orbit than traditional approaches and we can do that at a more reliable, more robust way than state-of-the-art arrays. And really what we have brought together at Redwire really presents the entire continuum of capability to our customer. You know, so whether it's a few hundred watt array on a small asset to a few kilowatts for a ESPA class or an Archinaut enabled system, maybe ten kilowatts on an ESPA class asset, all the way up to the solar arrays that we are developing for the power propulsion element for NASA's lunar gateway that are going to be the largest, in terms of power generation, solar arrays ever deployed in space. You know, just in that power generation segment that we're really covering the entire waterfront. But, and then we have some really great next-generation technologies that we're working on for deployed RF structures for both power, collection and transmission. But by bringing together the companies we have augmented our knowledge of what the art of the possible is in deployed structures for space assets. And by bringing together really talented folks from Loadpath and Rocco and Deployable Space Systems who, in some cases the folks from Deployable Space Systems who just put up that iROSA array, they also worked on the original able rays that are on the space station. So they have this incredible depth of knowledge and then bringing them together with folks that are these world leaders in in-space manufacturing assembly of satellites and saying okay what can we do together, that just makes a much more – that makes a much tighter – package that makes our customers that much more confident that they can adopt these next generation technologies or they can adopt the state of the art technologies that we have. They know we are really really talented in this area, that the team we have is really really capable in this area.



---

Anthony Colangelo: It was at this moment that a storm struck where Andrew was hanging out talking with us and completely knocked out his power so we had to finish the interview on an old school phone call. So pardon my interlude that is what is happening here as we are getting ourselves reorganized.

Andrew Rush: Hey it's me.

Anthony Colangelo: We made it.

Andrew Rush: Yeah, yeah.

Anthony Colangelo: It's all good. I'm going to add a nice thunder clap sound effect to the recording, just to really drive home what happened there.

Andrew Rush: Right, right. And then the power went out.

Anthony Colangelo: I really only had one other question to wrap it up if you have a minute or two.

Andrew Rush: Sure. Yeah, yeah, absolutely

Anthony Colangelo: So what I was trying to get into is that the Voyager Space Holding strategy is kind of like find the common areas that we can take off of the sub-companies plates and make those things easier to deal with so they can just focus on what they are working on. I am curious if Redwire sees that strategy as viable or if there is tighter integration that you'd like to bring between these companies or is it all the way up until everyone is going to be Redwire and these brands are going to disappear over time?

Andrew Rush: Yeah, no that's a great question. One of the core tenets in the ways that I think Redwire is a great partner and a great home for folks' businesses and really really babies that they've been building up, is in offering a great platform, commonality of shared services, whether that be finance or HR or facilities or operations, but also bringing to bear some really great talent that we, as separate individual companies, would not have been able to attract on our own. You know, you have seen us bring on Al Tadros, our Chief Growth Officer who is just a just really a titan at Maxar for many many years. More recently, Mike Gold, who was an AA at NASA, and Dean Bellamy who has had a really amazing career in national security space arena. And these folks really help our teams be that much more successful. And certainly there is power in being One Redwire. You know, the team is used to me saying the old adage if you want to go fast go alone, if you want to go far go together. And that's really a philosophy that underpins how we approach integration and working together, because we have some really amazing technology across the organization, really talented folks across the organization and by bringing them together and having more integrated offerings, you know, having that cross selling, having that... introducing one company to another legacy company's customers and driving business together forward, that really lets us be as successful as we can. So unlike some folks that have more of a holding company model, we celebrate the companies that we bring together and their legacies and their capabilities and their cultures, but we really want to go far and go together to get there.

---

Anthony Colangelo: Is there a process where the companies that Redwire acquires can take a moment to say: well now that we are part of a larger group we have these projects that are actively underway that we could reach out to some sibling companies and bring them into the fold? Is that a process that either exists or something that you'd like to see?

Andrew Rush: So Anthony you cut off just in the middle of your question.

Anthony Colangelo: Sorry we are dealing with the weather here. Really I am wondering about the companies that join Redwire, that have all these active projects under way, is there a process in place or something that you'd like to see become part of the Redwire process, where they can reach out to the sibling companies and find areas to say: hey we've got this work going and we need help in this area that you're an expert in so join the team and do resource sharing in some certain ways? Is that something that exists today?

Andrew Rush: Within Redwire, the team absolutely acts as one team. And so part of that means that we have folks at one site that reach out on a regular basis to other sites and say: hey, you know, we have these resources available, or we have these, or we need these resources. And that lets us be much more responsive and nimble, you know, compared to the companies being, you know, being separate whether they're in a HoldCo structure or just as independent entities, where we can leverage each other in a very rapid way.

Anthony Colangelo: Very cool. Well Andrew I know we're dealing with some weather and some time constraints so thank you so much for joining me and for covering all that. I'm sure people are enjoying this kind of overview from, you know, the ROSA technical details all the way through what's going on at Redwire. So thank you so much once again for joining me here.

Andrew Rush: Certainly. It has been my pleasure Anthony and I look forward to seeing you in the future at Space Symposium or future IAC.

Anthony Colangelo: It's getting close. It's definitely getting close to that time. So I am very excited for that as well.

Thanks again to Matt and Andrew for coming on the show. It was awesome to talk to them both and get all this context about the upgrades that are happening on the ISS and everything else that Redwire is looking to do in the present and near future. So, always a pleasure to have them on. Always cool to have guests return to the show in different roles than they were when they were on last. So definitely big thanks to them and Redwire generally for sending them my way.

Once again, thank you all for the support at [mainenginecutoff.com/support](http://mainenginecutoff.com/support) you help make this show possible. This is entirely listener funded, so if you like what I'm doing here, head over there and help support the show and get an extra podcast in your feed every week as I mentioned up front. It's a great way to stay up on space news, support the show and I think if you like this you'll really enjoy that. So check that out. But until next time, thank you all so much for listening. If you have got any questions or thoughts, hit me up on email [anthony@mainenginecutoff.com](mailto:anthony@mainenginecutoff.com) or on Twitter [@WeHaveMECO](https://twitter.com/WeHaveMECO) and until next time. I'll talk to you soon.

---

## **Forward Looking Statements**

This document includes “forward looking statements” within the meaning of the “safe harbor” provisions of the United States Private Securities Litigation Reform Act of 1995. Forward-looking statements may be identified by the use of words such as “forecast,” “intend,” “seek,” “target,” “anticipate,” “believe,” “expect,” “estimate,” “plan,” “outlook,” and “project” and other similar expressions that predict or indicate future events or trends or that are not statements of historical matters. Such forward looking statements include estimated financial information, including without limitation, forecasted revenue and revenue CAGR. Such forward looking statements with respect to revenues, earnings, performance, strategies, prospects and other aspects of the businesses of Genesis Park Acquisition Corp., Redwire or the combined company after completion of the Business Combination are based on current expectations that are subject to risks and uncertainties. A number of factors could cause actual results or outcomes to differ materially from those indicated by such forward looking statements. These factors include, but are not limited to: (1) the occurrence of any event, change or other circumstances that could give rise to the termination of the merger agreement governing the proposed business combination; (2) the inability to complete the transactions contemplated by the merger agreement due to the failure to obtain approval of the shareholders of Genesis Park Acquisition Corp. or other conditions to closing in the merger agreement; (3) the ability to meet NYSE’s listing standards following the consummation of the transactions contemplated by the merger agreement; (4) the risk that the proposed transaction disrupts current plans and operations of Redwire as a result of the announcement and consummation of the transactions described herein; (5) the ability to recognize the anticipated benefits of the proposed business combination, which may be affected by, among other things, competition, the ability of the combined company to grow and manage growth profitably, maintain relationships with customers and suppliers and retain its management and key employees; (6) costs related to the proposed business combination; (7) changes in applicable laws or regulations; (8) the possibility that Redwire may be adversely affected by other economic, business, and/or competitive factors; and (9) other risks and uncertainties indicated from time to time in other documents filed or to be filed with the SEC by Genesis Park Acquisition Corp.

You are cautioned not to place undue reliance upon any forward-looking statements, which speak only as of the date made. Genesis Park Acquisition Corp. and Redwire undertake no commitment to update or revise the forward-looking statements, whether as a result of new information, future events or otherwise, except as may be required by law.

## **Additional Information**

In connection with the proposed business combination between Redwire and Genesis Park Acquisition Corp., Genesis Park Acquisition Corp. intends to file with the SEC a preliminary proxy statement / prospectus and will mail a definitive proxy statement / prospectus and other relevant documentation to Genesis Park Acquisition Corp. shareholders. This document does not contain all the information that should be considered concerning the proposed business combination.

---

It is not intended to form the basis of any investment decision or any other decision in respect to the proposed business combination. Genesis Park Acquisition Corp. shareholders and other interested persons are advised to read, when available, the preliminary proxy statement / prospectus and any amendments thereto, and the definitive proxy statement / prospectus in connection with Genesis Park Acquisition Corp.'s solicitation of proxies for the special meeting to be held to approve the transactions contemplated by the proposed business combination because these materials will contain important information about Redwire, Genesis Park Acquisition Corp. and the proposed business combination. The definitive proxy statement / prospectus will be mailed to Genesis Park Acquisition Corp. shareholders as of a record date to be established for voting on the proposed business combination when it becomes available.

Shareholders will also be able to obtain a copy of the preliminary proxy statement / prospectus and the definitive proxy statement / prospectus once they are available, without charge, at the SEC's website at <http://sec.gov> or by directing a request to: [investorrelations@redwirespace.com](mailto:investorrelations@redwirespace.com).

This document shall not constitute a solicitation of a proxy, consent or authorization with respect to any securities or in respect of the proposed business combination.

#### **Participants in the Solicitation**

Genesis Park Acquisition Corp. and its directors and officers may be deemed participants in the solicitation of proxies of Genesis Park Acquisition Corp. shareholders in connection with the proposed business combination. Genesis Park Acquisition Corp. shareholders and other interested persons may obtain, without charge, more detailed information regarding the directors and officers of Genesis Park Acquisition Corp. in Genesis Park Acquisition Corp.'s prospectus relating to its initial public offering filed with the SEC on November 24, 2020. Redwire and its directors and executive officers may also be deemed to be participants in the solicitation of proxies from the shareholders of Genesis Park Acquisition Corp. in connection with the Business Combination.

Information regarding the persons who may, under SEC rules, be deemed participants in the solicitation of proxies to Genesis Park Acquisition Corp. shareholders in connection with the proposed business combination will be set forth in the proxy statement / prospectus for the transaction when available. Additional information regarding the interests of participants in the solicitation of proxies in connection with the proposed transaction will be included in the proxy statement / prospectus that Genesis Park Acquisition Corp. intends to file with the SEC.