Space, The Next Frontier?



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RUDY MAJID: Hello, I'm Rudy Majid and you're listening to The Alger Podcast, Investing in Growth & Change. Space has been getting a lot more attention lately, especially following SpaceX's IPO. Here to help me unpack the space industry, where we are today, and some of the longer-term shifts that could help create potential opportunities down the road, is Andrew Gustin, Senior Vice President, Senior Analyst, and Head of the Industrials Sector. Andrew, thank you so much for joining us.

ANDREW GUSTIN: Rudy, it's great to talk to you today. Thanks so much.

RUDY: It's my pleasure. Before we get into the industry itself, can you explain how space fits into your work at Alger, and why it has become such an important area for you to follow?

ANDREW: Sure. I am part of the industrials team. Historically, I have covered aerospace and defense, capital goods. My team also covers AI-empowered infrastructure, and because of my coverage of the aerospace industry, I had a little bit of a background in the space market and I got the exciting assignment to cover SpaceX. It's been incredibly interesting to learn about space and it really seems like an area of incredible disruption and innovation, in my view.

RUDY: Looks like we are in for a fascinating discussion. So, when we talk about the space industry, what are we actually talking about?

ANDREW: So, the space market today, I think we can categorize into three or four buckets, and there's a growing handful of public and private companies playing in these areas. I mentioned SpaceX, which completely disrupted the launch market, so they are providing access to space to other companies in addition to launching their own payloads. Then you have a whole bunch of other companies who are trying to get into the launch market as well as developing new business models once in orbit. So, other companies that are trying to offer launch and are a bit behind SpaceX but making progress include Blue Origin, which is private, Rocket Lab, which is public, Firefly is another public one, and…there are also incumbent launch providers such as ULA, United Launch Alliance, which is the JV between Lockheed and Boeing, and there are some international launch players as well, including the Chinese. Aside from launch, once you're in space, some of the key markets are defense, imaging, and communications. So, we believe there is a rapidly growing market for defense-related space operations and this includes surveillance, it includes missile defense, it also includes space-based communications. There is also commercial communications businesses. You have Amazon trying to get into orbital communications with their own constellation. You have a company called AST SpaceMobile, which is trying to do a direct-to-device network. And of course, you also have SpaceX, which has built a constellation of 10,000 satellites and has an offering called Starlink, which provides broadband internet and they are also moving

into the direct-to-mobile-device market. Then you have Earth-imaging, so there is a company called Planet Labs and they basically take pictures of the Earth and monetize those, selling images to consumers, enterprises, and governments. Then you have the manufacturing supply chain, companies that manufacture satellites and other key components. A couple of the public companies there are MDA Space, which is a Canadian company, and York, which is a relatively recent IPO. In addition to that, Rocket Labs, SpaceX, and some of the other big players also do satellite manufacturing for themselves as well.

RUDY: You mentioned launch as one of the first major parts of the space economy. And it seems like so much of the industry depends on getting into orbit more reliably and at a lower cost. Why are launch economics so important to understanding where space may be headed?

ANDREW: About 10 years ago, SpaceX pioneered the concept of reusable rockets, and that was a radical departure from how all space rocket launches had previously worked. Previously, rocket launches basically meant that the rocket was used once and then it was expended, and it was extremely expensive because essentially, the vehicle was thrown out after one use. And Elon Musk had the vision that it doesn't have to be this way, and when we fly on an airplane from New York to Los Angeles, we don't throw out the aircraft after one flight. And by reusing the rocket and amortizing the cost of that rocket over many launches, we can dramatically reduce the cost of launch per kilogram relative to how it was done in the past.

RUDY: How difficult is all of this, and where are we at today?

ANDREW: It's incredibly difficult. The existing SpaceX vehicle is called the Falcon 9. And the Falcon 9 is partially reusable, the booster stage, which is like the bottom part where the propellant is, gets reused. It actually comes back down and it typically lands on a drone ship or it can land on land and then get refurbished and sent back up.

RUDY: Is there anything in development right now aimed at reducing the cost of launching into orbit?

ANDREW: We believe SpaceX is continuing to move fast and SpaceX has a much larger and fully reusable vehicle called Starship, which they're on the cusp of deploying commercially, and that has the potential, in our view, to significantly increase their domination of the launch market.

Starship, they think they're going to be able to have it fully and rapidly reusable, so that you're going to be able to refuel, refill it with cargo, and take off again.

And so, the idea with Starship is, you could actually have multiple takeoffs and landings in one day, and it's a much larger vehicle than the existing one and they're going to have a whole bunch of launch sites. So, we believe you have the potential for just a tremendous amount of mass to go into space, and with reusability, that brings down the cost per kilogram another order of magnitude.

So, in our view, it will be really interesting to see if they are successful with Starship and the extent to which others like Blue Origin and Rocket Lab can make advances and try to emulate SpaceX's success with reusable rockets.

RUDY: So, Andrew, do we have any stats on the cost to launch into orbit and how that's changed?

ANDREW: Most of the estimates you see for the current cost to launch for SpaceX are in the neighborhood of $2,000 a kilogram, which is down 85 percent from the way it worked 20 years ago with the old one and done launches. With Starship, the potential is another order of magnitude reduction, so potentially $200 a kilogram, possibly even less.

RUDY: Are other companies using reusable rockets?

ANDREW: Well, everyone has seen what SpaceX has been able to achieve and they're all trying to do the

same thing. There's only one other company that has actually succeeded in reusability and that's Blue Origin, and they did it 10 years after SpaceX did it, so I think it's safe to say SpaceX has a 10-year lead, but others are trying to copy SpaceX.

So, this is where it's really interesting. So, for Falcon 9, the nominal max payload for low Earth orbit is 23 tons. You also have something called Falcon Heavy, which is like basically a bigger version of Falcon that has three lower stages and that has a capacity of 64 tons. Starship V3, which is the latest version, is 100 tons, so it's basically 4X the payload of Falcon 9, and then Starship V4, which is coming down the road, is going to be 200 tons, another 2X bigger than V3. Now, as far as the other guys, Blue Origins' reusable vehicle is called New Glenn, and that's got a 45-ton max payload, but they have had some significant setbacks. And then the other guys are generally much smaller, so Rocket Lab, the Electron is 13 tons, so even quite a bit smaller.

RUDY: So, if orbital launch costs are expected to fall, what opportunities does that unlock?

ANDREW: It's a really exciting possibility. We think the demand for compute right now is just exploding and the proliferation of AI and agentic AI has the hyperscalers clamoring for as much capacity as they can put online. So, you have just a tremendous boom in data center construction and there's not enough power and there are all kinds of constraints around construction and interconnections and labor.

So, if Starship is successful, one of the things SpaceX is talking about doing is launching AI satellites. You may have heard of a so-called space data center. I think that's a little bit of a misleading term. The idea is not like there's going to be some huge building up in space that looks like a data center like we might have on Earth, but SpaceX is talking about launching AI satellites, which would be kind of like their existing Starlink satellites and there would be a whole constellation of them. Each individual one would have a relatively modest amount of compute, maybe 100 kilowatts, think of it as like a rack of compute in space.

And if you have thousands and thousands and thousands of these in a constellation, and if you power them with solar arrays, they can be in a special kind of orbit called sun-synchronous orbit where the sun is going to be always shining on them and they're going to be cooled through radiated cooling with a really large radiator that comes out the backside, and this is going to be really difficult, in our view.

The coolant and the solar manufacturing that would enable this are difficult problems to solve, but with the cost of launch coming down by that much and with scaled manufacturing of these satellites, SpaceX thinks that they can make the cost competitive with terrestrial data centers.

RUDY: When might that happen?

ANDREW: So, at some point, the cost of an orbital data center is going to cross the cost of a terrestrial data center. And there's a lot of debate right now as to whether that's three years away or ten years away or maybe longer, but when that happens, we believe you potentially have a new vector for deploying AI compute. And if SpaceX controls launch, they have a competitive advantage, in our view, in deploying that compute.

RUDY: And if orbital compute does become more practical, what parts of the supply chain could benefit?

ANDREW: You're going to need tremendous solar cell manufacturing. You're going to need radiation-hardened components. You're obviously going to need the compute. You're going to have other chip suppliers supplying compute.

RUDY: And are there risks involved?

ANDREW: Well, there's a lot of risks. I mean, for one thing, they have not yet actually demonstrated full reusability with Starship. They have landed the booster, they have caught the booster. This was a couple of years ago. They used the chopstick arms.

They have never actually caught the upper stage. So, when they try to do that and if they can successfully do that, that's going to significantly de-risk this entire proposition, in our view.

But it's important to emphasize this has not been demonstrated before and Elon Musk actually says that doing this is the single hardest engineering challenge in the history of humanity, so you really can't overstate how difficult it is, and it's kind of like the bull case for some of this really hinges on their ability to do it.

RUDY: We talked about the near-term impact on data centers, but if these developments do progress, and the cost of getting into orbit continues to come down, what longer-term markets could potentially open up?

ANDREW: There are a whole host of really interesting longer-term markets. One is getting to the Moon, developing a lunar base. The Chinese and the U.S. are basically in a race to develop a lunar base and establish a presence back on the Moon. There is resource extraction. There's something called helium-3, which is a variant of helium that is very scarce on Earth but is used in critical applications such as semiconductor manufacturing, nuclear and other specialty applications, and it's highly abundant in the surface of the lunar soil, so if we could capture some of that and bring it back to Earth, that is a very exciting long-term TAM, in our view.

There's point-to-point terrestrial travel, so with Starship, SpaceX is talking about being able to transport people basically onto the other side of the Earth in an hour or less.

There's also zero gravity manufacturing. In our view, without gravity, there are whole new possibilities for manufacturing and chemical engineering that aren't possible on Earth, so there's a whole pursuit of new pharmaceutical formulations that we can't do on Earth and other types of manufacturing that we can't do on Earth. We don't even know what the possibilities that might come of this are, but we are starting with a lot of R&D in zero gravity environments and we believe there are whole new TAMs that potentially could get unlocked.

RUDY: Andrew, this has been a fascinating discussion. Before we wrap up, what is the key takeaway for investors? And how does this relate to Alger's investment philosophy?

ANDREW: Yes, there's no question that we believe space represents a classic Alger investment opportunity because you have a way of operating that has been completely disrupted. You have a lot of capital flowing into an ecosystem, and you have enormous TAMS that are only just now being understood.

I do think we are on the cusp of a new frontier and it's not only related to AI but even more broadly than that. It looks like our kids and our grandkids someday are going to live in a world where space is an important part of humanity, where we have a presence in space, where we're exploring farther than we've ever been before and we think there's going to be new businesses and new opportunities for humans in space. We believe we are just at the very beginning of that and … we think it's going to be a lot of fun to watch.

RUDY: Andrew, thank you so much for being on the podcast.

ANDREW: Oh, my pleasure. Thanks so much, Rudy.

RUDY: And thank you for listening, for more insights, please visit www.alger.com

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