

# Space Capital Podcast S01E06 - NASA's Role in the Entrepreneurial Space Age with Eric Stallmer Transcript

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Welcome to The Space Angels Podcast, episode six, NASA's Role in the Entrepreneurial Space Age. I'm your host, Chad Anderson, CEO of Space Angels - the world's leading source of capital for early stage space ventures. The purpose of this podcast is to provide investors with the context and information necessary to understand the real risks and opportunities in this dynamic new entrepreneurial space age. In this episode, we'll be exploring the relationship between the private space industry and government as it relates to early stage space investment strategies. This is an incredibly timely topic because, wow, what a year it's been for the space industry. We're only three months in, and already we've seen the SpaceX Falcon Heavy launch, Space Angels has added two new companies to our portfolio, the White House released its proposed budget for NASA, and the National Space Council had its first meeting of the year. It really seems like space has been top of mind for government in 2018. So, why does this matter to investors in space? Well, let's just say that the impact of NASA on the development of private enterprise cannot be understated. There's an old industry adage that says to do business in space, means to do business in the government. People often think entrepreneurs, like Elon Musk, have achieved success all on their own. But spoiler alert, the government has played a major role in the development, growth, and revenue of companies like SpaceX. In fact, the entire commercial space economy is built on a foundation of sixty-plus years of technology developed by governments. The reason I'm so excited for today's show is because we're going to be zeroing in on a question that comes frequently in conversations. Which is, with all this entrepreneurial activity in space, what is NASA's role? And to discuss this topic, I couldn't think of a better guest to have on the show than Eric Stallmer. Eric is the President of the Commercial Spaceflight Federation, an advisor to the National Space Council, and an advisor to the Space Angel's venture fund. He knows the ins and outs of the regulatory environment and its implications on commercial space. Before I bring in Eric, just a heads up that we had a bit of an issue with his audio and it sounds like there is a bit of a Cylon effect in his voice. So, with that, Eric, welcome to the show.

**Eric:**

Thank you so much for having me, Chad. I'm really excited to talk with you today.

**Chad:**

Thanks. So, let's start by having you tell us a little bit about the Commercial Spaceflight Federation.

**Eric:**

Sure. The Commercial Spaceflight Federation is an industry trade organization located in Washington DC. We're made up of about eighty-five different member organizations that range from the whole gamut of the space industry. From the launch providers to the space ports to the satellite manufacturers to the satellite operators. To people that are looking to build and work in

space up on the Space Station, build habitats. So it's a real tremendous cross section of the commercial space industry that we represent. And when I say, represent, a lot of what we do is advocate for companies to the Federal government, and to State governments, on various rule and regulations that the industry has to abide by. And- and how we can shape these rules and regulations as the industry is maturing at such a rapid rate. And obviously we've had great success in the industry with the innovation that's taken place, you know, from launch and satellite technology. So, it's been a very exciting time to be in the commercial space industry.

**Chad:**

That's great. And so, you're helping to nurture the ecosystem by working with legislators and regulators to help understand the innovation that's happening, and also how to regulate and keep things safe and operating officially. But also allowing that innovation to flourish. Is that accurate?

**Eric:**

Exactly. You know, in the simplest terms, I like to say, why we exist is to promote and protect the industry. Promote through the outreach, to getting the word out, of what's going on in the commercial space industry to various, you know, players, if you will. Whether they're from the government perspective, but also from the investment community. To people that are just- the media that's excited to cover this industry. But also to the... to the legislative folks that are, you know, writing laws that could have a major impact on what's going on in our industry. How it's taxed, how it's funded, how the rules apply. Because the game is changing tremendously. And so, it's not limited just to the legislative actions, but it's also the regulators, the different government agencies, and it's also working with the White House on what they're vision for space is to the American public and how we can help shape that.

**Chad:**

That's perfect. Thanks. And then so starting big picture, what are the differences between government space and commercial space?

**Eric:**

Well, I think you think of government space, the first thing that comes to mind is NASA. You know, NASA's such an iconic organization and agency, and they have done- they've been literally at the forefront of advancement in space for the last sixty years. And that's kind of- And then, of course, the Department of Defense has probably twice the budget that NASA has in promoting, you know, the safety and security of our Nation and the work that they do in space. That's what you think of when you think of government space, and some for big government space. Where commercial is more this entrepreneurial spirit. The folks that want to provide services and see that services are available. Whether the services that they're providing are remote sensing, satellite communications, or launch. Whatever it may be. That is... that's the difference that's going on. And we're seeing quite a paradigm shift right now on the role that the commercial space industry is playing.

**Chad:**

Great. Thanks. In our most recent space investment quarterly, the Q4 for the end of 2017, we talked a lot about rockets. In that it shows that commercial launch capacity is growing at a much faster pace than that of government. Now you have the Falcon Heavy launching, giving a commercial option for deep space. What does all this mean for the launch market?

**Eric:**

Well, it means that there's options out there. And historically, there weren't a lot of options out there for the payload... from the payload perspective. You know, government launches, historically, have been very expensive. A lot of times when you think of government launches, the biggest customer is the Department of Defense and, you know, the intelligence agencies. With the launch market, the changing, you know, aspects of the commercial launch... the commercial launch side of the house, you're seeing a lot more commercial launches at a more inexpensive price point. SpaceX last year, for instance, did nineteen launches. You know, commercial launches. Whether the government was a customer or, you know, a private company was a customer, and that, that's one of the greatest- one of the biggest numbers that we've seen in a long time. So, we're seeing a big shift in the amount that the government launch... launches. And also, what the government is paying for these launches, as well.

**Chad:**

So, with commercial launch being cheaper, the capacities coming online a lot more quickly, what do you think the future of government launch look like, given the increasing role of commercial launch vehicles?

**Eric:**

I think the government market will continue to be steady. Because, as you said, Nations need to have their own organic launch capability, if they can. Now, sometimes they don't have launch vehicles, and so they need to depend on foreign launch vehicles. And we see that in a number of ways. You know, right now, the main launch companies are European countries- are the Europeans, the Chinese, the Russians, the Indians, and the US. With new entrants coming online. The Japanese as well, my apologies. But new entrants are coming online. But if a government needs to depend on one of those countries for their own... dependent launch capabilities. But the commercial sector, so that- With that I see as being steady, uh, steady growth. The commercial sector has the opportunity to launch from various places, various payloads, whether they be commercial or government payloads. Where Blue Origin, for instance, in two years could be launching a satellite for the Singapore government. You know, hypothetically. That's where we're seeing that shift. A commercial launcher with government payloads, or a commercial launcher with commercial payloads. And the government to government market I think will be consistent.

**Chad:**

So, I want to get into the NASA budget a little bit now. Today, the 2018 budget was passed by the House and is expected to pass in the Senate. It looks like NASA's gonna get a billion and a half above what the White House proposed. Assuming that this passes, what does this mean for NASA?

**Eric:**

I think it means great things for NASA. There's a couple areas of interest that NASA has... has focused on that's gonna suit NASA very well. There's a hundred and thirty million for a program called Restore L, which is an innovative satellite servicing program that will basically help extend the life of current satellites that are operating in space right now. It's starting with government satellites, but I think this could lead to more commercial ventures. If you can refuel a satellite in space, you extend that life of the satellite, you could double the life of the satellite to, you know, I think, on average, satellites last ten years. This, you know, get an extra ten years out of the satellite. I think this is a very interesting approach. And I- What's exciting about this is this is something... this is something that NASA does well. The deep science, the work with the industry to help develop these cutting-edge technologies. We're also seeing twenty million dollars in the budget for the flight opportunities program. This is another great partnership that NASA has to seek out launch vehicles to fly payloads, and test these payloads, whether it be in sub-orbital or orbital atmosphere. And to, you know, to test out new technologies. And we've seen great success and great products come from these flight opportunity programs. Like, one that comes, for instance, is, you know, added manufacturing or a 3D printer in space. You know, this- to do technologies like that. To have a 3D printer on the International Space Station, and really manufacturing parts of whatever the astronauts may need there. You have to test this out in a sub-orbital atmosphere before you can actually move forward. And this is some of the opportunities that the flight- that flight opportunities will provide to launchers, as well as to some of these payload providers. There's also thirty million dollars in there for the venture class launch services, and we've seen great success with this. There's a handful of companies, Rocket Labs, Virgin Orbit, Vector, these are the small launch companies that are looking to develop with their launch vehicles, but also to launch these smaller payloads that aren't, you know, your typical large scale - medium to large scale rockets. These are more of your smaller rockets that can deliver critical payloads into space. And so, for them to get thirty million dollars, that's a huge investment. So, we're pretty excited about that, as well.

**Chad:**

Great. And so, as investors in commercial space who are looking across the spectrum from launch to lunar transportation, what should we be paying attention to?

**Eric:**

An opportunity that has risen is through the two different lunar approaches innovations. One is through the small lunar vehicle programs that appeal to companies like Moon Express and Astrobotics, and the other is for a commercial approach to lunar landers. And so, NASA will put out a request for proposals, request for information, RFPs, RFIs, as they call them, to get more information to solicit, eventually, to extend contact- contracts out to these providers. And what they'll probably do is award two or three contracts to various companies that are engaging in these lunar landers or lunar prospectors. And that's a pretty exciting time.

**Chad:**

Were there any points of concern in the budget? And if so, how are those being addressed?

**Eric:**

One concern that came out of the budget, and this came out of the President's initial... the budget that came from the President before it got to Congress, was the longevity of the International Space Station. The International Space Station has been in space now over twenty years. It's doing fantastic science. But it's getting to that stage where it needs more and more maintenance, and you need to more science, you need to really fully extend the full capabilities of the International Space Station. So, one of the initiatives, or one of the discussion points that came out. was kind of was thinking about shutting the station down on or about 2025. And there was a lot of concern about this. This is a great investment, a twenty-billion dollar investment, that the US and other Nations around the world made to this international laboratory. And I really believe now that we have a commercial crew program at the end of this year, early next year, that will be bringing more astronauts up on a routine basis. These are two US companies, Boeing and SpaceX, that were awarded the commercial crew contract. It gives you more range of operations that astronauts can do on the maintenance side of it, on the research side of it, to extend the life of the space station and continue the fantastic science that is going on up there. So, Congress is very supportive of the International Space Station. And so, what I think we're looking for is a transition plan. If they want to commercialize the International Space Station, what is the plan. You know, we don't want to just, you know, auger this into the ocean, you know, in 2025. And I don't think that was the White House's intent. But let's have a discussion, let's have a transition plan on how to best utilize the Space Station for the next twenty-five years.

**Chad:**

Got it. And there's a number of commercial space station companies that are coming online. Wouldn't they be interested in an early departure and early decommissioning of the Space Station, so that they can get into business?

**Eric:**

I think they would like to know what NASA's plan is before they can really establish what their plan is. If NASA says, "Hey, it's gonna be done in 2025." I think that gives them a better idea of what they need to do, where they need to be. But at the same time, these companies use NASA in a great variety of ways, and I think will continue to work with NASA on, you know, demonstrating technologies on the International Space Station. So, whether they'll be ready by 2025 to take over commercial operations or whether it's a gradual hand-off, knowing definitively what the timelines are, what the expectations, would help them, you know, in developing their business plan a little further out.

**Chad:**

I see. So, I think what you're saying, is there are efforts underway, and there's companies, commercial companies, that are working on this. But this is a big project and the hand-off needs to be coordinated between the government and the commercial players.

**Eric:**

Yeah. I think the biggest- We want to know what the transition plan is. What does NASA and the commercial industry envision what this transition plan is? Twice in the agency's history, I think they have failed. They failed from the Apollo Program to the Skylab, or- and rather, Skylab and the gap that we had until the shuttle took off. And then in more current time, with the shuttle program ending five years ago. Now we have this five, six-year gap where we have no access to

bring US astronauts on a US vehicle into space. We have to depend on the Russians. So, let's have a smooth transition plan that we don't have this big gap that we have to overcome. A more consistent plan. A continuity plan, I should say.

**Chad:**

Yeah. Makes a lot of sense. We're still living that gap now, so let us learn from the past. I've got some questions here about the National Space Council. Can you tell us a little bit about the National Space Council? What is it? What are its objectives?

**Eric:**

Sure. The National Space Council is an organization that it's made up of several members, cabinet members that have a vested interest in space. Department of Transportation, or I should say, the Secretary of Transportation, Secretary of Commerce, Secretary of Defense, Homeland Security, the National Security Advisor, the FAA, NASA, and a couple other... cabinet level organizations that meet a little more than quarterly with the Vice President. The council's headed up by Vice President Pence who oversees kind of the clearing house of all things space in this country. Whether it be from a launch perspective, the licensing, export controls, the role that DOD plays in space. So, the National Space Council's meeting on these issues. The idea is, let's try to work together. Figure things out in your lane. Whether it's Department of Transportation or it's Department of Commerce. But if these- If issues kind of escalate, they come to the council level and they sort it out at the council. Now in addition to the National Space Council, they also enacted a White House user advisory group, which is about twenty-four, twenty-five representatives from a cross section of industry and academia and government. So there's... there's five or six CEOs from commercial space industry. You have your larger companies, your more traditional companies, Lockheed, Boeing, Northrop Grumman. They're represented. There's a handful of former astronauts that are involved. Just deep thinkers. So, about twenty-five, twenty-seven, I believe, members of the council that are this advisory group, that will advise the council on what direction industries going and what direction we think the Nation should be going in space.

**Chad:**

Okay. So, if the council has such a leading role in space in this country, what exactly is its relationship with NASA?

**Eric:**

Well, NASA is one part of the council. What they're saying is, you know, NASA plays an oversized role because their sole mission is space. But NASA's not a regulatory agency. So, for companies that I represent, Blue Origin, Sierra Nevada, SpaceX, for instance, one of the prime agencies that they have to work with is the FAA. The FAA's Office of Commercial Space Transportation that helps license launch vehicles. You know, any time you want to launch your... you have a vehicle you need to launch; you have to get a license to do that. So, NASA doesn't play a role in that. The Air Force has the ranges, so they help support the commercial industry, you know, through the use of administering- administering the ranges. So, again, we always think NASA as space and they're clearly the main space agency that is one the council. But many of these other cabinet levels have a great deal of influence in space. And we're seeing others that are taking an even greater role and greater interest in space, such as the Department of

Commerce. The new sector of Commerce is very interested in space. And the idea of what Commerce should be doing to be promoting the US commercial space industry.

**Chad:**

That's really helpful. Thanks, Eric. And so, with the user advisory group that you mentioned, so this is comprised of representatives from private space companies, some astronauts, it is the users advisory group, right? So, what are some the UAGs main objectives in advising the National Space Council?

**Eric:**

I think the main objective is to give the government a good sense of where industry is, how industry can support the Nation's space agenda, and areas that need help in working on. You know, whether it's- One of the big objectives was, for instance, regulatory reform. Are enough regulations in place? Are there too many? Not enough? Where can we improve on that? The direction that we've seen from the Vice President is that, you know, what he has heard from industry is, "Hey, these regulations and the timetables are just too burdensome for the industry." The government needs to, you know, be working with industry at the speed of need, not at this traditional glacial pace that the government has historically moved at. And so, we're already starting to implement these changes. We're working with the FAA, working with their Office of Commercial Space Transportation, and establishing rule making committees that are really streamlining the launch. For instance, the launch licensing process, which has been a great... a great venture because the government is asking industry, "How can we do better?" And I really feel that the government is listening and really wants to help, which is somewhat to the contrary of how things have traditionally worked. So, I think that's, you know, a good objective of the UA- UAG. To help promote the industry, to help, you know, further along what are the best practices to help the Nation's space program.

**Chad:**

Great. So, it sounds like you're a proponent of the National Space Council and its role in bringing all these disparate pieces of the space economy, the national space agenda together.

**Eric:**

I have been pleasantly surprised at the role that the White House and Vice President's office has played in establishing the National Space Council. A gentleman I know, Scott Pace, Doctor Scott Pace, who came from the George Washington Space Policy Institute. A very well-regarded individual in Washington and space circles. And they've really gauged industry quite a bit. And I say selfishly, you know, they've really engaged the commercial industry on what we can offer, how soon can we offer this, and what help do we need, in what areas do we need help. So, all indications that I've seen, there's a great... tremendous amount of interest from, you know, the Executive Office on the commercial space industry and moving it forward. So, it's an exciting time. I wasn't around for the first space council, I wasn't in the industry back then, so I can't speak confidently on, you know, the success that they had. In the Obama Administration, they used more of the Offices of Space, uh, OSTP, the Office of Science and Technology Policy. And it was limited in its scope of how it could help the greater industry. It was more of the whole science spectrum. So, this is an exciting time. I think they've got a good bipartisan spirit in the

space community. So, we're gonna have to see how it works out, but so far all indications are that they're willing to work with industry.

**Chad:**

Entrepreneurs are changing the way we look at leadership in space. The industry was previously led by NASA and the government, but commercial companies now have tremendous influence. The National Space Council even moved a number of space activities to the Commerce Department, like you mentioned earlier. From a government perspective, what does the future leadership in space look like, you think?

**Eric:**

I think it looks a lot more commercial. I think you're seeing entrepreneurial individuals that have an over-sized influence on the... the space industry on the way we do business in space. It's simple. When you bring the cost of launch and the access to space down, it opens up the opportunities of what you can do in space. And I think you're seeing, there's several individuals out there that are committed to bringing the cost of access to space down, the frequency of accessing space, you know, increasing that frequency, the launch cadence. So, I think... I think it's gonna be the industry in the commercial sector that are really gonna have a great voice in this leadership transition. And of course, you know, the government is a government. We cannot be successful without the important roles that the government plays. You know, from the regulatory, from the international promotion, from the rules that have been established to make sure that we're... that there's good actors out there and that we're operating in the safest possible manner. But I think the government depends more on what industry is doing. You know... I saw that our deficit went up another trillion dollars. The government can't afford to do all these things that they once liked and enjoyed doing, and that was a uniquely government role. Some of these uniquely government roles are now uniquely industry. And that's a big shift that we're seeing.

**Chad:**

Great. Thanks. So, Eric, I know that you agree that space startups provide an unprecedented opportunity for investors, and that there has never been a better time to get involved in space investing. Can you give us your personal take on that?

**Eric:**

It's amazing the amount of startups that we're seeing, that the impact that they're having. That what these startups can do with just a small amount of seed money. Whether it's, you know, developing new launch vehicle and parts using additive manufacturing, or using laser communications to, you know, to download data from space. These are big ideas that ten, fifteen years ago would have cost a fortune. But what we're seeing is just great progress from the investment community. From the... Whoever it may be from. You know, private capital from venture capitalists to the Angel Network that's out there. To getting these companies the initial seed money that they need to take it to the next level. And people are listening. People are listening because these innovative products that these entrepreneurs are bringing to market are literally the next big things and the next big steps that we're taking. This is an unparalleled time that what we're seeing, the rate of investment. I think the investment last year was three point nine billion in the commercial marketplace from private sector investments. That's an incredible number. And I'm pretty confident that number's only going to grow, and the opportunities are



only gonna grow as well. So, I'm very upbeat about that, and it's very exciting for me to be at this position where I can see a lot of these startups come into fruition. Five years ago, no one had ever heard of Planet Lab, or what they're doing, and changing the whole landscape in the remote sensing industry. It's just very exciting times. I think, huge what the Space Angels, the role that they have played and the impact that they have had in the industry, I think when we first started talking, you know, it was really just a handful of investors looking at, you know, just a small amount of companies. And now, the amount of investors that are out there that want to be a part of this industry, and the amount of investments they're making in companies that the Space Angels are looking at. It's really unbelievable. And it's... it's a tremendous tool that companies have, and not just - I shouldn't say tool. It's... Just searching for the word... It's such an opportunity to know that your idea could be supplemented by this investment community that otherwise wasn't there five, ten years ago. And that you have these benevolent investors that want to see the advancement in humanity, to expand our reaches of technology and innovation. And the Space Angels have really been at the forefront of doing that. And the products that you guys have, the different reports that are being cited everywhere, you know, in your most recent space investment quarterly review. This is being handed around all over Capitol Hill to help understand this community. You know, that- You didn't have reports like this before. And understanding where money is coming from and where it's going to. This is a- It's a critical need that the industry has, and I think Space Angels are doing just a remarkable job filling this need for industry.

**Chad:**

That was beautiful. Thank, Eric. And, finally, many of our listeners have strong connections to Federal and State representatives. What should our audience be communicating to their legislators?

**Eric:**

I think the great interest that is out there across the country in, and I say it again, from the commercial space aspect. But, you know, what some of these big industries are doing, as well, to let the lawmakers know what's out there. No disrespect to, you know, members of Congress and the senators, but they get a little myopic on the areas that they focus on. And we only have a handful, maybe a dozen or, you know, a dozen and a half of lawmakers that are really dedicated to advancing our national space program and helping these entrepreneur companies along. Now it's- That number's growing and it's kind of spreading like religion, but you really have to get in there and educate them on what's going on in the industry. What is the impact of... of these new technologies that are coming to bear? What is- What are these large constellations? What does that mean to, you know, people in the world, in America? You know, on these imagery satellites that... this low-cost imagery that farmers can be using. How do you- How do you tell that story? And people have to get in and tell the lawmakers these stories, and how they can help and influence this industry to help continue growing. So, I think that's an important role. But more and more members of Congress are taking a greater interest in what's going on in space. And the nice thing is, this is what makes my job fairly easy, is that space continues to be a bipartisan field. No one- There's very few people out there that say, "I hate space. I can't stand what NASAs doing. Oh, the private sector shouldn't be doing this." You don't hear that too often. You hear the great stories of industry working with NASA, industry advancing where NASA can't. So

it's very impressive right now what's going on. And, again, it's that education of the lawmakers that is really critical.

**Chad:**

Great. And so, if one of these investors or one of our audience members was to come across one of these senators with an interest in space, or one of these congressmen or women with an interest in space, and they had two minutes, what would be the one thing you would hope that they would... impress upon their legislator?

**Eric:**

I think that it's real. That space is very real. I think that we're at a historic time in our society of what's going on in space. And that the tremendous opportunities are there, and to get onboard. And to be more aware of what's going on in the space community. Whether it be government space or commercial space. The innovation is just remarkable what's taken place and the type of investment. And it's not costing the government this enormous sum of money that it historically has. So, I think those are some of the messages that you want to get across to lawmakers. To be supportive, to educate themselves on the great mission that, you know, a lot of these companies are taking on.

**Chad:**

And to utilize more commercial services because it's saving them money.

**Eric:**

Saving them an inordinate amount of money. And what's happening is this cost-savings is becoming contagious. It's almost embarrassing for companies that have to say what they've been charging over the years, and they're making these strides to reduce the cost of the, you know, whether it be launch or other areas. They know that they have to get the cost down or they'll go out of business. There's so much competition, and the commercial marketplace is doing this. Driving that competition, lowering that cost, and that's gonna rise many boats, I believe.

**Chad:**

Well, that is a beautiful, beautiful way to end this, I think. Really though, I think we're just scratching the surface of these issues. We've been coming down to Washington and playing a larger role in the conversation there. And with your role... as the voice of these entrepreneurial space companies and your role as an advisor to the National Space Council, I think that this is a much bigger conversation and I look forward to having you on future shows to continue the dialog. Thank you so much for your time, and for educating us, and providing some insight into the future government leadership in space and how it's working with the entrepreneurial space sector.

**Eric:**

Chad, I really appreciate you having me on today. And keep continuing to do what you're doing with Space Angels. It's a remarkable institution that you have. And I look forward, as always, continuing talking with you.

Thanks for tuning in to The Space Angels Podcast. As today's episode has made clear, yet again, there has never been a better time to get involved in space investing. So, I want to invite you to visit our website, Space Angels dot com, where you can learn all about Space Angels membership and how you can get involved in this exciting new sector. And before I sign off, I want to put in a plug for our next episode in which we'll be exploring high altitude balloons and Stratolites with Jane Poynter, CEO of World View Enterprises.