

Better Futures: The Future of Space

(chat transcript, Zoom event, 25 Sept 2020)

12:17:32 **marshall Eubanks**

He is faint

12:29:07 **Bruce Cahan**

Here is my email (*email redacted*) or (*email redacted*)

12:37:18 **Antonino Salmeri**

Well said Brad!

12:39:47 **Bruce Cahan**

Economics is a key driver for “warfare” and if managed well, economics can grow interdependencies that mitigate the temptations for warfare in space

12:45:27 **Namrata Goswami**

Ye Pejian is NOT a minor official; he is the Head of the China Lunar Exploration official; received the highest civilian honor for space contributions from President Xi, and is now the lead for the Chang'e. he is also member of the Policy Advisory committee for the CCP, a high ranking party official!

12:47:07 **Peter Garretson**

Is the fight really here? That is like assuming that the destiny of the European nations was not significantly decided in the new world. Only the vastness of space resources can completely alter the balance of economic power among the great powers.

12:48:53 **Bruce Cahan**

Chase, Michael. “The Space and Cyberspace Components of Belt and Road Initiative,” The National Bureau of Asian Research, September 2019, page 19, ([link](#))

12:49:00 **Peter Garretson**

It is already destabilized—the PRC is already taking action in this regard. It is certainly our option to cede the terrain — but de-escalation just means surrender.

12:50:41 **Hal Fulton**

Speaking as the least knowledgeable person here — it seems better to overestimate a problem or threat rather than underestimate. I perceive great value in preparedness.

12:52:14 **Michael Mealling**

I think the disagreement is in priorities based on timing and role of the military in economic development.

12:54:38 **Michael Mealling**

Historically the idea of the military NOT having an economic development role seems to be a recent and not universally held idea.

12:56:20 **Peter Garretson**

Yes @Michael. There probably is a much smaller disagreement about actual resources than about stated priorities, roles and missions. Blue Water wants all planning and acquisition not to FORECLOSE broader options—even near-term must consider a ‘frontier enabling test’. For example: does a propulsion system offer eventual incorporation of extraterrestrial propellant? Does a new C2 or navigation system enable 3-body trajectory solutions? Is Space Launch just about getting to 9 reference orbits, or does it offer opportunities for weekly sorties and refueling?

12:57:08 **Sean McClain**

Michael Mealling, that is a very astute observation. This is essentially the 3-sided problem that Michael Laine has described. Historically, the military helped westward expansion by performing surveys, building forts, and generally informing the infrastructure of the Western frontier. That infrastructure allowed the rate of economic development to increase and the West to be settled quicker than it otherwise would have been without military aid.

12:59:22 **Peter Garretson**

Blue water looks at this like investing with long-time compounding cumulative returns...they may not pay off for 30 years, but delaying even one year of a small investment makes a gargantuan difference in your industrial productive capacity (including breakout to weaponization) at the out-years.

12:59:29 **Hal Fulton**

Sean M: How is that precedent altered (if at all) by the fact of a wilderness being OWNED by a nation (as opposed to, e.g., oceans)?

13:00:37 **Michael Mealling**

@Sean or coaling stations in the Pacific, overseas base location choices to bolster allied economies, etc. I think the issue is the rest of the US Government and the country itself isn't aware of this choice

13:03:04 **Hal Fulton**

Peter G: I like the idea of a “frontier-enabling” test. It seems to me that in space activities (more so than others), it is appropriate to look into the future “farther and sooner,” as we are standing at the edge of infinity.

13:06:35 **Sean McClain**

@Hal Fulton, Great question. This is why the maritime domain is a better template for making analogies. In the maritime domain, ships and islands are where actors can claim "property." While the Outer Space Treaty prohibits actors from claiming ownership of celestial bodies, it DOES NOT prohibit actors from creating space stations in space or extracting resources from celestial bodies for economic purposes.

13:06:37 **Peter Garretson**

Staffers thinking it was 1,000 years out is not new: Consider the skeptics of America’s Transcontinental Railroad (completed in 1869) In 1844, Asa Whitney (cousin of cotton gin inventor Eli Whitney) proposed to the U.S. Congress that America build a transcontinental railroad. U.S. Sen. Thomas Benton of Missouri responded that it was “an imposture, a humbug; it could have emanated only from a madman . . . science was unequal to overcome the Allegheny Mountains—and now Whitney proposed to scale the Rocky Mountains, four or five times as high! Why sir, it’s madness!” . . . “You are one hundred years before your time.

13:09:12 **Sean McClain**

@Michael Mealling, you're not wrong. So much of what this conversation encompasses is rich and nuanced in concepts (and relatively unknown to non-space professionals).

13:09:28 **Michael Mealling**

I agree that analogies can be very dangerous...

13:09:44 **Hal Fulton**

This happens even in our own community. Arthur C. Clarke did not patent the concept of geosynchronous satellites because he did not believe he would live to see them. Of course, he was off by many decades.

13:10:11 **Hal Fulton**

(That was in response to Peter G.)

13:11:53 **Peter Garretson**

But it is the BROWNWATER who is igniting space military conflict and in the worst place possible LEO...rather than shifting the conflict further out where it uplifts all humanity, and is more difficult to fowl.

13:12:00 **Michael Mealling**

But does that preclude the military from acting as a customer of those lunar companies?

13:12:19 **Peter Garretson**

@Michael: In my view, that is an essential role of the Space Force.

13:13:12 **Peter Garretson**

Why does an overtly operating NAVY not undermine shipping and investment on the seas? It doesn't because presence alone creates a feeling of security and consequence vs neglect.

13:13:13 **Michael Mealling**

And it has had that role in the past.

13:13:55 **Sean McClain**

If those companies are providing goods and services that the USSF could use in its missions beyond GEO, then that would make logistical sense. This is also an example where the Space Commodities exchange would need to be in place.

13:13:57 **Peter Garretson**

Yes @Michael, consider Clementine, which mapped and found water on the Moon—and tested the key systems for an SDI brilliant pebbles system.

13:15:09 **Namrata Goswami**

As strategic thinkers, we cannot assume something will not happen, because if it does that what? At least we were prepared...think U.S. navy preparations before the second world war that made them so effective when faced with conflict...imagine if the Naval general board, or the Naval War College, and Chief of Naval operations had state din 1900 that the U.S. does not have to built power projection capacities and then 1941 struck!!!!

13:15:24 **Peter Garretson**

Here is a terrific example of how Military-Supported, Commercial-led expansion set the board for US victory in WW2: [\(link\)](#)

13:15:42 **Bruce Cahan**

Like on Earth, Space Commodities reinforce demand and utilization of each other and new commodities, accelerating the pace of space development beyond the limits and politics of fiscal budgeting

13:16:27 **S**

It seems that the brown water philosophy is dependent on the axiom that "We are a long way from people living and working in space." But space is an

exponential technology, which builds on and draws from other exponential technologies. I don't know how far we are from people living and working in space. I do know that it will happen sooner than we expect.

13:16:48 **Peter Garretson**

Josh's theory is not a PRESCRIPTION for exclusion, but a DESCRIPTION of how domains are and can be controlled and so must be considered.

13:17:19 **Namrata Goswami**

The famous fleet problem scenarios that the U.S. navy worked on since 1900 that made them the force they were in 1941.

13:18:32 **Sean McClain**

@S, indeed. Humans are great at linear thinking. We have a very hard time thinking in terms of exponential and logarithmic growth.

13:19:12 **Peter Garretson**

The same claim could have been made about airplanes when they belonged to the Army Signal corps: Airplane's utility to war is only that they can help transmit and gather info...clearly such narrow uses can change with investment and creativity.

13:19:47 **Michael Mealling**

I'm hoping our military can execute on both short and long term strategies at the same time.

13:20:33 **Peter Garretson**

Which arms races have ended in conflict? Certainly the Cold War arms race did not. Often times it was the default on an arms race that created the problems.

13:21:26 **S**

@Peter, the fleet buildups from the late 1800s, and in fact

13:22:01 **S**

much of the buildup prior to WW1 were an arms race that ended in conflict.

13:22:08 **Peter Garretson**

@Michael: I totally think you can be. But you make your near term training and acquisition decisions in the SHADOW OF THE FUTURE always present. There are a myriad of tiny decisions that put you on the road to somewhere, or down a dead end for which it is costly to have to re-orient and re-invest to rebuild once you realize you took a wrong term.

13:23:10 **Namrata Goswami**

actually I would say the fleet build up were a response to being attacked by Japan and then the larger axis countries..

13:23:17 **Michael Mealling**

Peter, exactly. That's why I am wondering why this is an issue.

13:23:44 **Peter Garretson**

But @Brad if 100% of your mil investment INCLUDES Cislunar and below—you are introducing the same overt military presence. In for a penny, in for a pound.

13:24:51 **Michael Mealling**

Question for the Brown water advocates: how far in the future do you think Blue water issues will exist that require strategic responses?

13:25:32 **Michael Mealling**

Peter, it doesn't need to be mil investment to achieve the same goal.

13:26:47 **Bruce Cahan**

Brad - Ideally, an international legal arrangement for economic development of space would create the stability that market participants seek - Unfortunately, the history of the UN's Space Treaty Development has lagged the pace of space technologies and interests - So what might work, and what I'm pursuing, is bringing into a Board of Trade those stakeholders (space suppliers, their customers, investors, lenders and others) who can AGREE AMONGST THEMSELVES how best through a Board of Trade Members Rule Book to assure their mutual interests

13:27:53 **Michael Mealling**

How long do you think a "long time"?

13:27:57 **Peter Garretson**

@Michael: No, it doesn't. But let me point out that strategic thinking for national advantage is DISTINCT from thinking for purely COMMERCIAL GAIN (and I don't expect companies on their own to protect national interests but rather to maximize their own goals); nor can I expect an S&T or Ideational power organization like NASA to seek national industrial advantage; It falls to the security community to do that sort of PLANNING and MANAGEMENT—that can be done with private or civil tools, but it must be designed (and likely helped) with Security resources.

13:30:07 **Michael Mealling**

Peter, absolutely agree. Very few US institutions think in these time frames. IMHO, we have lost that skill as a country.

13:30:21 **Peter Garretson**

[\(link\)](#)

13:30:51 **Peter Garretson**

We have real tools: [\(link\)](#)

13:32:02 **Peter Garretson**

Space Races have been VERY good for humanity. Why would you want to slow that down?

13:32:31 **Antonino Salmeri**

great point on the language Brad - narrative is everything these days

13:33:18 **Hal Fulton**

Michael Mealling: Hence the existence of the Long Now Foundation which you may be familiar with.

13:33:33 **Namrata Goswami**

Think pacific ocean with US naval presence; its not leading to overt conflict but reassures allies

13:33:42 **Peter Garretson**

Military resources in Cislunar might be less than 1% of national spending—but it still must help with the architecture, and 1% may be enough.

13:34:27 **Namrata Goswami**

Space security would presence capability and the US space force doctrine highlights that

13:34:37 **Namrata Goswami**

presence is about reassuring allies and partners

13:35:32 **Peter Garretson**

The cost of a L1/L2 SDA system is perhaps a couple hundred million—tiny compared to a single SLS launch. Yet it clearly communicates: We are watching. We care about what happens here.

13:36:32 **Namrata Goswami**

great debate. Enjoyed it

13:38:31 **Hal Fulton**

I have a general question. Have we historically treated planets/moons/asteroids as the only “islands” in the ocean of space? Should law address LEO, GSO, and Lagrange points (or has it already)?

13:39:05 **Hal Fulton**

(e.g., in terms of Outer Space Treaty)

13:39:42 **Bruce Cahan**

A Space Commodities Exchange adds transparency to see who what to provide in what orbits when?

13:40:06 **Bruce Cahan**

*wants

13:40:59 **Peter Garretson**

The OST specifically treats the Moons, it doesn't define “Celestial Body”, the ITU addresses GEO. The OST basically says everyone has a right to be in space and use space on a non-interference basis. There is no specific mention of the Lagrange points / orbits.

13:41:12 **Bruce Cahan**

Michael's “patient capital” point is crucial - A report is coming out shortly that details this set of arguments

13:43:34 **Sean McClain**

@Bruce and @Michael, thank you for the additional economic considerations in this discussion. This is truly the crux of the long-term problem.

13:47:44 **Tim Chrisman**

(email redacted)

13:48:18 **Bruce Cahan**

(email redacted)

13:48:28 **Michael Mealling**

(email redacted)

13:48:39 **Hal Fulton**

btw OPIC is now part of DFC - [\(link\)](#)

13:48:45 **Tim Chrisman**

We are working to create a Federal Space Port Authority that would be structured similar to OPIC / TVA and act as the commercial development 'belly button' for the federal space effort www.climb2.space

13:49:10 **Juan de Dalmau - ISU**

Great conversation. Here is my contact information: Juan de Dalmau President International Space University www.isunet.edu T: +33 388 655 446
(email redacted)

13:49:15 **Michael Mealling**

Hal, yep. which is an expanded scope.

13:49:19 **Peter Garretson**

Also, the speed is NOT independent of our STRATEGY and INVESTMENT—we can largely decide the speed by where we focus the societal energies.

13:49:40 **Bruce Cahan**

I've proposed a "Space Port Authority" to NASA...:)

13:49:55 **Tim Chrisman**

yea - NASA isn't interested - they want to discover new worlds :)

13:50:21 **Bruce Cahan**

So they said...

13:51:46 **Namrata Goswami**

actually China is all over Latin America: [\(link\)](#)

13:52:04 **Namrata Goswami**

I agree with general kwast

13:52:15 **Namrata Goswami**

we miss the key by highlighting military

13:52:39 **Namrata Goswami**

[\(link\)](#)

13:53:15 **Peter Garretson**

It is GOVERNMENTS that CREATE MARKETS.

13:55:01 **Peter Garretson**

YES! THAT is because the Space Force leadership is deficit, defaulting on providing such a vision!

13:56:22 **Brad Townsend**

A bit of a misconstruction of my argument, I look to avoid an arms race in space for a variety of reasons. I think those funds are better spent supporting economic competition. Lets build trade ships, not battleships

13:56:51 **Brad Townsend**

The problem is fear drives funding not potential opportunity

13:56:58 **Michael Mealling**

Michael, can you circulate a transcript of the chat?

13:57:44 **Namrata Goswami**

an article I wrote on the legal issues: (email redacted)

13:57:53 **Hal Fulton**

I am capturing it and will give to ML.

13:58:07 **Michael Mealling**

TY!

13:58:12 **Peter Garretson**

It is fear of ECONOMIC strength and advantage that IS the arms race...and that is what drives military interests.

13:58:36 **Bruce Cahan**

Thanks everyone

13:58:43 **LiftPort**

Thank you everybody!