

# China's Space Dream is America's Nightmare

by [Brandon J. Weichert](#) (September 2019)



*Moon, Horizon, and Flowers (Rocket Rollout)*, Jack Perlmutter, 1969

If you look up at the moon tonight, understand that you are not looking at a primordial rock that has orbited above our heads, rearing its pale, pockmarked face every night, since the dawn of humanity. Instead, you are looking at a treasure trove of natural resources. As you stare up at the pale,

dimpled, and ancient face of Earth's only natural satellite, understand that there is a Chinese rover [roaming](#) the previously-unexplored dark side (the part that permanently faces away from Earth) of the lunar surface, testing the soil to determine whether or not China might be able to strip mine the moon. Should Beijing conclude that the moon is home to a bevy of abundant, untapped natural resources, then China's space program will return to the moon, and [exploit](#) those natural resources for China's benefit before anyone else can.

In fact, as you will see throughout this piece, China's space ambitions are expansive, compelling, and a direct (and enduring) threat to the United States. For, it is not only in the area of space mining that China envisions becoming the dominant player. China also seeks to acquire true military [parity](#) with the United States in orbit of Earth; by building the capability to damage or destroy vulnerable American satellites and by potentially placing weapon systems—*disguised as civilian systems*—in orbit.

## Understanding Space Nationalism in China

The Chinese view space quite differently from their American rivals. China's space vision is a cold, clear-eyed, nationalist mission for space exploration and, inevitably, exploitation. As I've written [recently](#), the Chinese leadership cares "little for the betterment of humanity." They do not go

into space possessed of the same airy, globalist notions that so many American policymakers have been imbued with. What's more, the Chinese have a far more realistic—even cynical—view of space than most American leaders do. Theirs is a belief that nationalism will empower China's rise in the strategic domain of space. And, once ensconced as the dominant force in the strategic high ground of space, the Chinese will be able to have control over the other terrestrial strategic domains of space (land, sea, air, and cyberspace).

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The Chinese leadership fundamentally believes that space is an [unpossessed resource](#) waiting to be conquered by the nation (or group of nations) that have the gumption to take it before other states can. The cynicism of Chinese leaders when it comes to space is in their belief that China must do everything it can—including weaponizing space—to prevent China's rivals (read, the United States) from denying space to them.

Or, as Ye Peijian, the head of China's lunar mission, [said](#) in December of last year:

The universe is an ocean, the moon is the Diaoyu Islands, Mars is Huangyan Island. If we don't go there now even though we're capable of doing so, then we will be blamed by our descendants. If others go there, then they will take

over, and you won't be able to go even if you want to. This is reason enough [to go to the moon].

The Chinese *want* space. Why wouldn't they want space? Think about it: the solar system is [replete](#) with celestial bodies that, while lacking life in the way that Earth possesses, it has a treasure trove of mineable natural resources. The moon is [believed](#) to be home to vital commodities, such as magnesium, aluminum, silicon, iron, and titanium to just name a few. Further, the moon is believed to proffer new age commodities, such as Rare Earth Minerals (these are minerals that are hard to reach via mining on Earth, making them very expensive), as well as an isotope known as Helium-3 (He-3). Many scientists believe that He-3 can be used as an efficient, non-radioactive fuel source for *nuclear fusion*. Scientists claim that just 25 tons of refined He-3 harvested from the lunar surface could power the European Union or the United States *cleanly* for a year.

Not only is the moon potentially the [next Persian Gulf](#) of natural resources, but the millions of asteroids that separate the inner solar system (the sun, Mercury, Venus, Earth, and Mars) from the outer solar system (Jupiter, Saturn, Uranus, Neptune, and Pluto) offer trillions of dollars- worth of opportunity for the nation-state or corporation that can claim them. There are asteroids nearby that are believed to house pure gold, for instance. There are asteroids that possess a host of other, valuable natural resources, any of which, if mined, could lead to the rise of the world's [first trillionaire](#). Right now, because of investments that the Chinese Communist Party (CCP) has made into their space program, it is China, not the United States, which would likely directly benefit from these stunning developments.

## China's Space Dream

Indeed, over the years, the Chinese government has [identified](#) space as a primary zone of technological and economic development, but more importantly, as an arena of strategic competition—specifically between itself and the United States. Going back to 1957, when the Soviet Union launched humanity's first satellite, *Sputnik*, into orbit, Mao Zedong, the founder of the Chinese Communist Party, vowed that his nation would build satellites as well. By the 1970s, China launched their first satellite into orbit. There was a delay between that launch and when China placed their first people into orbit—that came in 2003—but since the rise of Xi Jinping to the Chinese presidency in 2012, China's "space dream" has been put into overdrive. President Xi has claimed that his ["space dream"](#) is a cornerstone of his overall push to make China stronger (the "China Dream" program). In many ways, China has attained its greatest space achievements since Xi's rise to power—from placing not one, but two, temporary space stations in orbit since 2011, to landing the world's first rover on the dark side of the moon.

Xi has outlined what the space dream looks like. [According](#) to Xi:

Developing the space program and turning the country into a space power is the space dream that we have continuously pursued.

First, on a national prestige level, the plan entails China

finally catching up with the United States and the Russian Federation “after years of belatedly matching their space milestones.” As you will see, however, China’s sheer commitment and their consistent investment in their space program (as well as the technologies that undergird a national space program) imply that they will not only match American and Russian space capabilities within the next few years, but they will quickly leapfrog the Russians and Americans in space as well.

Second, on the practical application side, China is keen on assembling parts of their new, modular space station—the *Tianhe-1*—in space within the next year. Since 2011, when the Chinese launched the *Tiangong-1*, their first rudimentary space station in Earth orbit, Chinese *taikonauts* have honed their space stations skills. After the *Tiangong-1* [crashed](#) to the Earth in 2017, the Chinese already had placed their slightly more advanced, [Tiangong-2](#) in orbit. Now that *Tiangong-2*’s mission is nearly complete, Beijing believes it is ready for a more permanent structure in orbit.

The [Tianhe-1](#) will be of a similar, modular design to that of the International Space Station (ISS). And, like the ISS, the Chinese are [inviting](#) other nations to partake in the program—except for the United States (this is considered payback for when the Clinton Administration [refused](#) to allow the Chinese to take part in the ISS out of understandable fears that China would engage in technology theft, if they were granted access to the advanced ISS). China hopes to have their station assembled in orbit by 2022 when the station’s first Chinese residents are expected to arrive. The irony is that the *Tianhe-1* is expected to become operational at precisely the moment that the ISS reaches the [end of its lifespan](#). In essence, then, the United States’ only permanent

space station will be gone while China becomes the only nation to possess a space station in orbit—and the Americans will be explicitly barred from having access to that station to boot! This moment will be akin to the moment in 2011 when America's space shuttle program was [terminated](#) by the Obama Administration, leaving the United States without an indigenous manned spaceflight program for the first time since the 1960s.

The Chinese Academy of Space Technology has also [outlined](#) the details of how China plans to build a permanent settlement on the lunar surface. The facility will be built in the mid-2020s and will be [run by artificial intelligence robots](#) until Chinese *taikonauts* are sent to manage it. Presently, China's leadership believes that their people will be living on the moon by the end of the decade.

China has endured setbacks in their space program that bears noting. Namely, their entire lunar and space station program is [on hold](#) until the technical kinks of their potent Long March V rocket can be worked out. There has already been a yearlong delay after a version of the rocket crashed into the Pacific Ocean shortly after liftoff from the Wenchang Space Launch Center in Hainan Province last year due to an oxygen supply problem. This type of heavy-lift rocket, similar to the old NASA *Saturn V* rockets, is the only way China could get the large and heavy modules for the *Tianhe-1* into Earth orbit; they are the only way that China could launch certain sensitive, heavier military satellites into high Earth orbit; these rockets are also the only way to get sample return missions to the moon, and eventually, Chinese *taikonauts* to the moon. The oxygen-supply problem that the previous launch of the Long March V rocket experienced occurred because of a turbofan failure in the rocket engine. The Chinese have since

worked that out and are now streamlining the production of the next phase of the Long March 5. It is believed that the next test will occur [before](#) 2019 ends.

This last technical hurdle will be overcome, one way or the other. China is simply committed to their cause more than we understand. This is an oddity, because the United States was trailing their Soviet rivals in the early phases of the Space Race during the Cold War. Yet, the United States refused to cede the strategic high ground of space. Instead, the Americans intensified their investment in their national space program and greatly expanded its national investment in science, technology, engineering, and math (STEM) programs that would help the nation achieve its goal of becoming a space power. Although the Americans neither placed the first satellite in orbit nor the first man in orbit, the United States did prevail in putting the first men on the moon. By the time that the Americans achieved this, the Soviets were relegated to a similar place that the Americans today are relegated: the sidelines. The Reds of yesteryear could only place satellites and cosmonauts in Earth's orbit, leaving the far more impressive deep space exploration missions to their American rivals.

Embarrassingly, it is from the sidelines today where American and Western scientists continue laughing at the Chinese, without taking note of the fact that the United States [abandoned](#) its own heavy-lift rockets—the Saturn V—in favor of the cheaper and weaker rockets needed to place the space shuttle in low-Earth orbit (LEO) more than 30 years ago. The capabilities to return to space beyond Earth's orbit are almost gone, meaning that the U.S. will be playing catch-up to the Chinese soon. In the Second Space Race, China is playing the upstart Americans while the United States is, sadly,

playing the Soviet Union.

## American Military Power Relies on Satellites

There are, of course, more pressing strategic concerns behind China's increased interest in space development. Presently, the United States enjoys what's known by military experts as ["Full-Spectrum Dominance."](#) In essence, the United States military has overwhelming superiority over any potential adversary in the major strategic domains of land, sea, air, space, and cyberspace. Or, at least, that is what the Pentagon has striven for since the end of the Cold War. As one Air Force officer once remarked to me, "The last thing any American should want is to have their military enter into a fair fight with the enemy." By investing in systems and strategies meant to ensure that the United States remained as the preeminent military power, it was assumed that no other rival would dare risk challenging American might, because doing so would lead to their ultimate destruction.

Yet, there is a fundamental flaw in this perception. For a country like the United States to have the kind of "Full-Spectrum Dominance" that its military leaders desire, it must maintain a massive, bloated force. Today's U.S. military is a relatively small expeditionary force. At 315 million citizens, the military accounts for [less than one percent](#) of America's total population. And, at the height of the Second World War, the military had [roughly 16 million men](#) under arms. In 2015, the Department of Defense reported that [1.4 million Americans](#) on active duty in the Armed Forces. Ever since its terrible experience in the Vietnam War, the United States is understandably reticent to embrace a national draft in the event of a war. Since the Nixon Administration, the country

has preferred its [relatively small all-volunteer force](#). There are many merits to a force like this. One of the downsides, however, is the fact that such a small and mobile force, operating far over-the-horizon (away from North America)—across multiple strategic domains, against rivals that are closer to their home territories and with traditional larger forces—means that the United States must rely on more advanced technology to give them an edge in combat.

Nearly all Americans agree that the U.S. military is the most-advanced, best-trained, and [well-funded](#) force in the world (possibly in history). And, many intuitively understand that America's incredible military capabilities derive from its possession of advanced technology, which allows its far flung forces to operate in tandem; communicate instantaneously with each other and with their combatant commands; as well as allow for the American forces to move at greater speeds than their bloated, less-advanced enemies. What few comprehend, though, is that [satellites](#) are the unseen and unsung, relatively small (both in quantity and in physical size), workhorses of the U.S. military. Roughly [70 percent](#) of the U.S. Army's weapons systems, for instance, rely on satellites to function properly. America's dominance in satellites explains how a relatively small invasion force of around 150,000 U.S. soldiers and Marines could take Iraq in 2003 in a little more than a month.

But what happens when those satellites are removed from the strategic equation?

This is a question that, until very recently, few American policymakers seriously pondered. The Chinese, on the other hand, have been asking themselves this very question since

they witnessed [America's "first space war,"](#) better known as Desert Storm, in 1991. At that time, China had possessed a large military that was armed primarily with Soviet-type weapons. They also hewed closely to Soviet military strategy (despite the fact that, by Desert Storm, China had become a Soviet rival). Similarly, Saddam Hussein's Iraq was brimming with Soviet military technology and its officer corps was well-versed in Soviet military strategy. On the eve of the U.S. attack on Iraqi forces in Kuwait, Saddam's military was the [fourth-largest in the world](#). Saddam was so confident that he could resist any American-led offensive that he vowed that his forces would engage in the ["mother-of-all battles"](#) against the Americans and that his forces would visit the same humiliation upon the U.S. military that the forces of North Vietnam did.

*The Americans, though, had other plans.*

Namely, since the Vietnam War, the Pentagon had assiduously built its force to fight a direct confrontation against the Soviet Union in the [Fulda Gap](#) (a small patch of territory that separated West and East Germany that would have become the site of any potential Soviet invasion of Western Europe). To accomplish victory against a Soviet-type foe, the Americans had enhanced their capability to rapidly mass and to be highly-mobile force—one in which its land, sea, and air forces were integrated, allowing for quick, precision-strikes that would cripple the Soviets. The secret lynchpin in this strategy were America's burgeoning satellite constellations. These tiny jewels in the night sky provided continual, up-to-date situational awareness for American forces engaged in combat operations.

When American tanks moved rapidly upon Saddam's forces through the desert—something that few planners at the time believed possible—taking Saddam's forces by surprise in General Norman H. Schwarzkopf's famous ["Left Hook,"](#) it was made possible thanks to America's rudimentary Global Positioning System (GPS). American satellites also made it possible to conduct the precision airstrikes against Saddam's forces which utterly debilitated the Iraqi military. As Fred Kaplan outlined in [Dark Territory: The Secret History of Cyber War,](#) U.S. intelligence had learned in the run-up to Desert Storm that Saddam Hussein had hired Western telecommunication firms to install fiber-optic cable linking Baghdad, Basra, and Kuwait City. They identified the location of these communications cables and destroyed them in the opening wave of air attacks against Iraq. American intelligence, though, knew that Saddam could migrate his communications traffic to a backup communications channel he had established which ran off microwave transmissions. With this knowledge in hand, the National Security Agency was able to park one of its covert "spy-in-the-sky" satellites over Iraq, and with its receiver, U.S. intelligence was able to eavesdrop on every Iraqi communication that was sent during Desert Storm. In Kaplan's words, "At every step [the NSA and American combat commanders] knew exactly what Saddam and his generals were saying and where their soldiers were moving."

Thanks to this generational leap in technology that the United States had enjoyed (courtesy of the Reagan era arms build-up), the United States was able to get ahead of its enemy and keep the Iraqis in a state of confusion as U.S. forces overran them. It is unlikely that Desert Storm could be fought today, given the proliferation of cyberspace and counterspace capabilities. In 1991, the United States was the unchallenged space power. It could easily—and stealthily—sneak its sensitive satellite into an orbit directly above its enemy's

home and simply listen in. Today, the Chinese (as well as the Russians, and quite possibly even the Iranians and North Koreans) have made considerable investments into building the capabilities that would make such high-tech American tactics useless.

In fact, when China witnessed the American success in Desert Storm; how the Americans cut through a Soviet-style military like a hot knife through butter, they were forced to reassess their own capabilities. Size did not matter so much as speed. And, speed was only effective so long as China's rival, in this case, the United States, was left [deaf, dumb, and blind](#). Beijing no longer felt that their military was capable of deterring future aggression from the Americans, So, following Desert Storm, the Chinese embarked on a reappraisal of their entire national defense strategy. It was the [Taiwan Strait Crisis of 1996](#), followed on by the [NATO bombing](#) of the Chinese embassy in Serbia in 1999 during the Kosovo Air War, that convinced the Chinese leadership that the United States was their number one threat. In each case, American military prowess was buttressed by America's satellite constellations—with devastating consequences for China's grand strategy.

In the first instance of the Taiwan Strait Crisis, the Clinton Administration decided to deploy two U.S. Navy aircraft carriers through the narrow strait separating mainland China from independent Taiwan. At that time, Beijing's leadership strove to intimidate Taiwan into not electing a president that Beijing viewed as a separatist leader. Although Taiwan has maintained their independence since 1949, the tiny island is not officially recognized as a sovereign state by China's leadership. Instead, China views Taiwan as nothing more than a rebellious, breakaway province—similar to how the Union viewed

the Confederacy during the American Civil War. After weeks of launching rockets across the strait going into the Taiwanese presidential elections, Washington suddenly deployed two aircraft carriers in response. This humiliated China and showed to the world just how impotent China was in the face of American threats. Ultimately, the show of American force prompted China to abandon their brinkmanship and allow the Taiwanese presidential election to move forward without further interference.

In the second instance, a NATO warplane bombed the Chinese embassy in Serbia's capital. Washington insists to this day that it was an accident; certain maps of the city had not been updated to indicate that China's consulate had moved locations. What NATO believed was a Serbian military installation was, in fact, the Chinese consulate. After it was bombed, days of [intense protest](#) against the United States broke out in China—notably at the U.S. embassy in Beijing, but also in the Chinese province of Chengdu, where the U.S. consul's house was [set on fire](#). The Chinese have never forgiven the Americans for these two incidents. Later, in the wake of the 9/11 attacks, the Chinese were again taken by surprise by American military prowess. American forces landed in Afghanistan and in a handful of months destabilized the Taliban regime there with a small contingent of forces, armed mainly with small arms, lots of cash (to buy the locals off), and satellite phones to coordinate precision airstrikes against the more numerous Taliban and al Qaeda forces.

American space power is a key threat to Beijing's vision for a world order which orbits the new Chinese empire rather than the [old American imperium](#).

Following former President George W. Bush's invasion of Iraq in 2003, Chinese leaders fretted that his Wilsonian commitment to making the world safe for democracy would lead the United States to embrace ever-increasing-levels of regime change missions through unpredictable unilateralism and preemption. Eventually, China's leaders feared that this missionary zeal would bring about a spasmodic mission to turn China into California, much as the United States was committed to turning Iraq into Idaho. Beijing's authoritarian regime could not simply allow for the United States to continue its quixotic quest to topple global autocracies.

## The Satellite War with China

After years of studying the American military giant, though, Chinese leaders have determined there were significant gaps in America's defensive systems. Namely, the potent (but relatively small) all-volunteer U.S. military was made capable by its reliance on satellites. China figured if they could remove that advantage, the Americans would be made impotent. Don't laugh this off. Few people realize just how important a handful of U.S. military satellites operating in what's known as geostationary orbit (GEO) are. In this high orbit, at 26,199 miles above the center of the Earth, a few constellations of large, unwieldy military communications, surveillance, and early missile warning satellites provide the bulk of America's strategic benefits. There are other constellations, of course, in lower orbits, but these constellations in GEO are critical assets providing the U.S. military with the bulk of its advantages.

In this one constellation, the [Wideband Global Satcom \(WGS\) constellation](#), which is paid for by the United States Air

Force, but its payload is managed by the United States Army Space and Missile Defense Command/Army Forces Strategic Command (USASMDC/ARSTRAT), there is a large component of America's military communications capabilities. The problem is that the existing satellites in the constellation are bulky and expensive. Their high orbit also means that the Air Force must launch replacement satellites in the constellation on special rockets (ironically, rockets powered by the Russian-built RD-180 engine), meaning that it is a cost-prohibitive endeavor to replace or add more satellites to this constellation. [So, at 10 units](#), the WGS is a relatively small and undefended constellation of satellites that are highly important for the United States to maintain its global military posture.

Similarly, the Navy maintains the [Multiple User Objective System \(MUOS\)](#), this small handful of satellites keep the U.S. Navy linked together around the world. Remove even a few of these systems and the entire Navy is thrown into disarray. Because these satellites are so far away from Earth, and because these satellites are so large and expensive to launch, there are few spares available. If a rival actor, like China, were to launch a blinding or other form of damaging attack upon these satellites, the ability for the U.S. military and its allies to mount effective defenses against a Chinese attack against, perhaps, Taiwan, would be negated.

Current [plans](#) for defending Taiwan have the indigenous, U.S.-armed Taiwanese fighting valiantly to hold the island against an invading Chinese force until the Americans eventually intervened against China. Presently, Taiwan has the advantage over their Chinese cousins. But, Beijing has made [serious investments](#) into developing the skills necessary to launch a massive invasion across the narrow Taiwan Strait and to

conduct a successful invasion of Taiwan. China's soldiers routinely train for such a terrible event. Taiwan's forces, no matter how well-armed, could not hope to defend Taiwan indefinitely against an invading Chinese force. The arrival of superior U.S. forces into such a conflict is almost a *fait accompli* under Washington's current posture. At the very least, Chinese leaders understand that Washington would be tempted to "do something" in the face of their aggression against one of America's oldest allies in the region. China's leadership asks itself, though: what would the Americans do if their military superiority was removed even before Washington could deploy forces to back-up the besieged Taiwanese? What if American forces operating in the expansive Asia-Pacific (or, Indo-Pacific, as Pentagon planners have taken to calling it) were rendered deaf, dumb, and blind with a silent Chinese attack on a key U.S. satellite constellation, such as MUOS or WGS? Would the United States risk its expensive military assets in a battle for an island that China was poised to take, if their technological supremacy was removed?

Herein lies the allure of "counterspace" weapons for China's leadership.

With counterspace weapons, Beijing's goal is to simply disconnect America's highly-integrated military; to remove the expeditionary force's ability to expedite its movements in a coordinated manner. As it stands, places like Taiwan, the Philippines, or Japan are all much closer to mainland China. With America's military spread throughout the world (and its center of focus still, unfortunately, in the Middle East), China understands that it can successfully act boldly *only if* America's ability to mass forces against them in a timely manner is mitigated. And, let's face it, the Chinese are not concerned about U.S. military movements in Syria or in

Venezuela as much as they are about U.S. actions in what they perceive to be their own sphere of influence, the Asia-Pacific. If the “breakaway province” of Taiwan expects to remain free of Chinese rule, then they will need a strong U.S. military presence ready to protect them. But, if the United States cannot effectively project its military power over-the-horizon in the vastness of the Pacific Ocean because key satellite constellations, such as the MUOS constellation, have been disabled or destroyed in orbit, then the Chinese have the time and advantages to assert their will over tiny Taiwan.

Decades ago, the great U.S. Air Force Colonel John Boyd, a hellraising, dog-fighter who made minced meat out of both his enemies in the unfriendly skies over North Korea, as well as his superior officers who strove to stymie his brilliance with mindless bureaucracy, coined the term “OODA Loop.” It is an acronym that stands for, “Observe-Orient-Decide-Act.” In today’s [PowerPoint-crazy military](#), many officers I know are sick-to-death of this phrase. They lament that its true meaning has been lost in the alphabet soup of Washington’s bureaucratic landscape. At its core, though, the theory was based on observations that Boyd himself had made while dogfighting Communists in MiG Alley and is usually meant to apply to the operational level of military campaigns. Without getting too far into the art of the OODA Loop, a key component of this theory has to do with acting faster than one’s opponents. America’s space power allowed it to observe, orient, decide, and act at a faster pace than any of its rivals of the last 30 years. Remove that space power and the United States cannot complete the OODA Loop in a timely manner. This slow-down means that a rival, like China, can get out ahead of the United States; that Beijing can effectively outmaneuver and complete the OODA Loop faster than the Americans who created the term to begin with. And, in today’s, high-tech environment, being outpaced by one’s competitors is

the death knell of any endeavor.

As Boyd [observed](#):

Most violent gunmen think that because they have the gun, people will do what they say and will just hide. They don't expect someone to come charging after them. By closing the gap, you're resetting your adversary's Loop because now they have to re-orient themselves to an unexpected change in the environment. You're making them have an 'uhhhh...' moment. By causing the reset, you've slowed him down, even if it's just by a few seconds, which gives you more time to complete *your* OODA Loop and win the battle.

The Chinese have watched the United States display its military power for decades. They have assessed that, as a whole, the U.S. military is virtually incapable of defeat under current conditions. Although, once one probes deeper beneath the surface of all of those bristling American defenses, there are a handful of technical weaknesses that a country, well-versed in high-technology, such as China, can exploit. After all, Achilles was only as strong as his heel...and America's Achilles' Heel is undoubtedly its weak posture in space. Like the person suddenly acting against the demands of a violent gunman, China's ability to [blind, dazzle, and destroy](#) key American satellites will give their forces the time they need to overcome whatever defenses the United States might be able to muster in the face of Chinese provocations against an ally like Taiwan.

Beidou: China's Replacement for America's GPS

Another aspect of the satellite war between China and the United States is over global Position, Navigation, and Tracking (PNT) capabilities as represented by America's Global Positioning System (GPS). The current GPS is an American system that was initiated by the U.S. military in 1978 to facilitate precision-strike capabilities for its military forces operating in distant theaters of operations. Inevitably, like the internet, GPS became a must-have component of the civilian economy. Like much of the rest of the world, China utilized America's GPS network. Yet, going back to the 1980s, Beijing was never comfortable with this arrangement. In the 1990s, China invested in developing its own GPS system. This move was in keeping with the general predilection of Chinese leaders to first imitate a technologically superior foe, like the United States, then to gain parity with that rival—while becoming self-sufficient—and then to ultimately defeat that enemy with a more advanced version of the technology they had initially replicated. In the process, the imitation leads to innovation.

China's version of the GPS constellation is Beidou (the Chinese word for the "Big Dipper"). No longer will China's military be beholden to the American-dominated GPS network to conduct their own precision-strike capabilities. Beidou's initial deployment has already allowed for Beijing to have total coverage in the Asia-Pacific. [By 2020](#), it is believed that Beidou will have global coverage—providing China with an unprecedented global strike capability. Undoubtedly, China is building out its cruise and ballistic missiles with both GPS and Beidou capabilities. In the event that the United States deprives China access of its own GPS network, then, China's military planners would not have to worry about losing precision-guided weapons capabilities. Instead, they would simply "switch" their forces off the American system and onto

their own.

Further, by making itself more self-sufficient in the vital PNT area, Beijing has reduced the threat that American disruption of these critical tools in a time of crisis between China and the United States, posed to Chinese forces. What's more, China's obsessive quest to create an indigenous high-tech supply chain, has allowed for Beidou to be totally supported by Chinese manufacturers and Chinese technical experts. The Chinese firm, Alibaba and the state-owned enterprise, China North Industries Corporation (NORINCO), formed a joint venture worth more than \$300 million "to build applications and technology to support and work with the Beidou system." What's more, this conglomerate has spread its tentacles to other Asian countries—even Taiwan—by getting China's various neighbors to accept Beidou interfaces. With these downstream technologies, Chinese hackers could conceivably "track" smartphone users through "embedded malware in devices containing Chinese-manufactured satellite navigation chips, and thus pose an information security risk to Taiwan." And, in the event that China did decide to wage open war upon their Taiwanese neighbors, the ability to use Beidou-related systems to track and launch precision-guided decapitation strikes against key Taiwanese leaders would pose a grave security risk to Taiwan's defense.

There is also the issue of Beidou becoming the basis of a Eurasian-wide PNT network that would displace the American GPS. China is seeking to build the greatest infrastructure project in history, known in Beijing as the "One-Belt-One-Road" Initiative. This program seeks to united as much of Eurasia and Africa together through land-based and maritime, Chinese-dominated trading routes. Should this ambitious program come to fruition, then it would create an economic

zone that could outstrip the productive capacity of the United States. Beidou is set to become the PNT network of this burgeoning economic mega-zone—something that will only enhance Chinese power and prestige, at the expense of the United States. Yet again, it is in space where this competition is most directly occurring...and it is in space where all but a handful of policy analysts like myself are ignoring these critical developments.

## The Pentagon Slows Everything Down

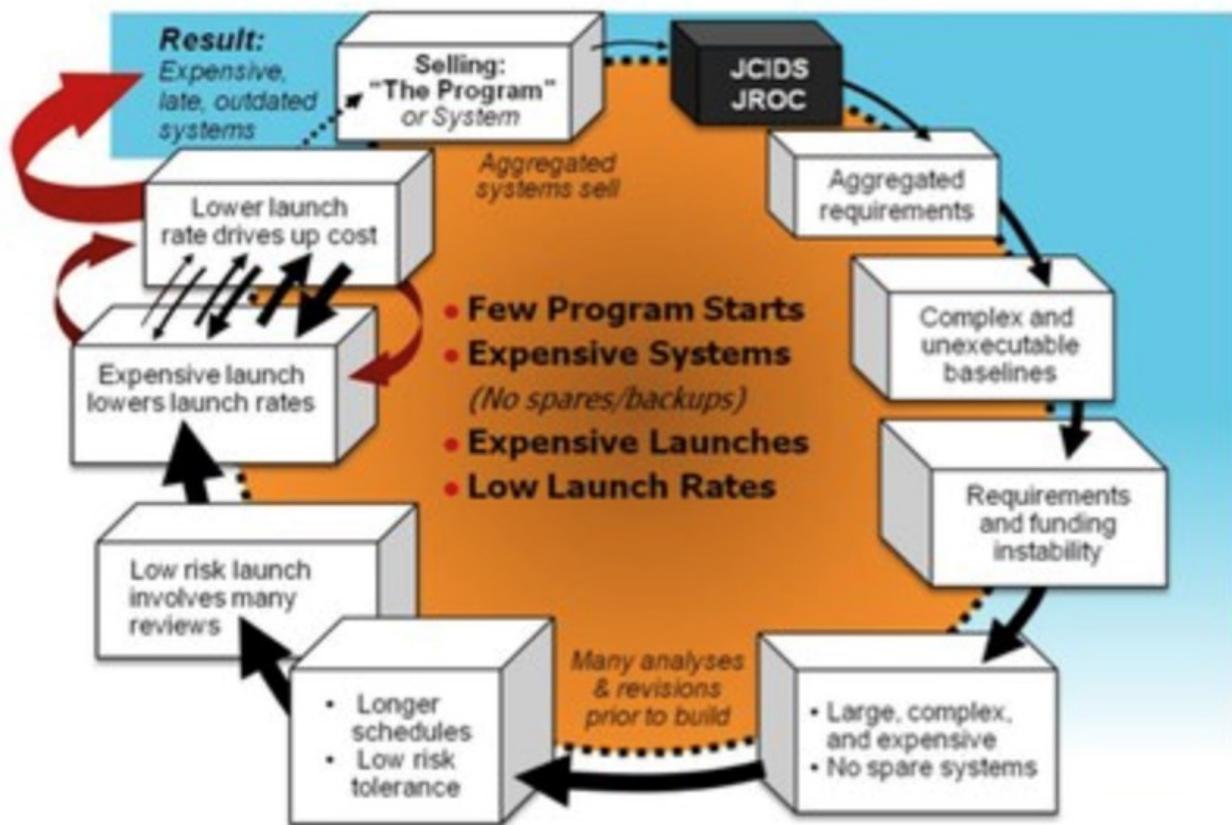
Related to the issue of the Sino-American “satellite war” is the fact that the United States military has proven adept at exploiting its clear advantages in the strategic domain of space over the decades. Yet, at the same time the United States was coming to rely on satellites at increasing levels, the methods for designing and deploying critical satellite systems have remained virtually unchanged over the decades. Technology has rapidly advanced since the heady days of the Cold War. Don't tell the government that, though, because until the rise of the Trump Administration, the protocols for acquiring new satellites were cumbersome and wholly ineffective in today's highly-competitive, fast-moving strategic environment.

As was mentioned above, military satellites tend to be heavier than their civilian counterparts and, because many of them are placed in higher orbits around Earth than their civilian counterparts, they must be launched on special rockets. After a vicious corporate war between two of America's biggest defense contractors, Boeing and Lockheed Martin, the Pentagon chose to unite the two defense contractors into a joint venture overseen by the Air Force: the United Launch Alliance.

This joint venture works closely with the military to launch military-grade satellites in what they believe are cost-effective ways. But they are not. Fact is, the Department of Defense needs to take steps to make their critical functions far more redundant than they presently are. They also need to ensure that the cost of launches are much lower than they are—otherwise key satellite constellations will go without timely upgrades; they will rely on older, [easy-to-hack](#) operating systems; and such sensitive systems will be unable to survive the kind of counterspace attack that China (and others, like Russia) might attempt against these satellite constellations.

In fact, things are so bad at the Pentagon that a retired Air Force general, Thomas D. Taverney, coined the way the Pentagon acquires its satellites as the [“Vicious Cycle of Satellite Acquisition.”](#) Some solutions include making most DoD satellites less advanced and also making them more compatible with civilian systems. This would, in turn, not only allow for the Pentagon to migrate key functions over to civilian satellites should a constellation, like the WGS or MUOS constellation be disrupted by attack, but it would also mean replacements could be more easily replicated and deployed. Also, making DoD systems more compatible with civilian ones would mean that special rockets would not be needed. Since military satellites tend to be heavier because the Pentagon tries to throw as many capabilities as it can into one satellite—known as bundling—they require more fuel to launch into orbit, making them more expensive than their civilian counterpart. But, making these systems less advanced, smaller, and more compatible with the civilian systems would mean they could ride-share on ordinary civilian rockets, reducing costs.

## The Vicious Circle of Space Acquisition



The Space Acquisition Vicious Circle.

There is also a desire to increase the size of the satellite constellations themselves. Instead of a key network, like the WGS constellation, possessing a paltry sum of 14 satellite units, the Pentagon should increase the number, thereby making it harder for the Chinese to degrade and destroy in a "bolt-from-the-blue" attack on America's satellites. By implementing the reforms that I spoke about in the paragraph above, you could effectively accomplish this goal in a quicker amount of time for cheaper. Also, making these systems more compatible with civilian satellites—creating what's known as "mixed constellations"—would prevent a Chinese surprise attack in space from being as devastating as it presently would be. A key reason the government doesn't want to even think about changing its unwieldy space architecture is simply because current conditions make it too expensive to conduct meaningful

space operations. The Chinese, though, are interested in developing ways to negate America's advantages in space meaning that their strategy is far cheaper than America's need to preserve its position in space by making its satellite architecture more survivable. Plus, when it comes to cost, Beijing is willing to pay any cost and bear any burden if it means having the capability to thwart their American foes on the other, terrestrial strategic domains.

Elon Musk and other smaller businesses seeking to work with the Pentagon have had an uphill struggle. The opaque defense bureaucracy likes working with the bloated defense contractors it has always worked with (Lockheed, Boeing, Northrup Gruman, etc). Yet, Elon Musk's *SpaceX* has proven that it can launch assets into space for far cheaper than their bigger rivals can. It should be a mission priority for any military officer operating in national security space policy to significantly reduce the cost of space operations. Cutting much bureaucracy; opening the military satellite business up to other smaller businesses that the Pentagon does not have a long history of dealing with; and making U.S. military satellites smaller, less advanced, and more compatible with civilian satellites will go a long way in achieving this goal.

## China's Counterspace Weapons

Presently, the People's Republic of China has crafted a suite of counterspace capabilities that should leave every American worried. Beijing has invested in [conventional anti-satellite weapons \(ASAT\)](#). These are missiles that are launched and can knock out satellites passing by in low-earth orbit (LEO). Not only do these missiles destroy targeted satellites, but it [often creates](#) a debris field that scatters outward and

threatens other satellite constellations in nearby orbits. If you've ever seen the 2013 Sandra Bullock film, *Gravity*, you'd have an idea of what high-velocity, cascading debris caused by an explosion in space can do to satellite constellations and space stations in orbit (it's called the ["Kessler Syndrome"](#)).

Chinese scientists have also [posited the notion](#) of installing a laser system on the bottom of their space station. They suggested doing so in order to assist in the clearing of dangerous space debris that human beings have created during the decades they've used space. Of course, like nuclear technology or the internet, space technology can be dual-use. A laser used to remove dangerous debris that threatens everyone in orbit could also be used to target the optical gear on American surveillance satellites and temporarily blind them. Many U.S. satellites can only be repaired remotely from the ground. When a satellite is disabled by a laser (or other technical glitch), the satellite tends to go into a power-reserve mode and wait for a ground operator to effect repairs remotely. The Chinese know this and understand fully that even an attack that temporarily blinds of U.S. satellite would buy Chinese forces operating elsewhere the time they needed to complete whatever nefarious mission they were on.

Then, there is the threat of [space stalkers](#). A technology that [I believe](#) the Russians have developed, the space stalker is a particularly galling piece of technology. It is a tiny, fast-moving, hard-to-track satellite with grappling claws that is theoretically launched in GEO. Once in high Earth orbit, it tailgates behind sensitive U.S. satellites, like those units belonging to the WGS constellation, and will use its grappling arms to physically push the American satellite out of orbit. Do this to enough satellites in this constellation, and you've just rendered the U.S. Army deaf and blind. A similar attack

on the Navy's MUOS constellation would have painfully similar results. Recently, [reports circulated](#) that U.S. sailors were having to be re-trained to navigate their warships by stars because the military had stopped training sailors in this basic maritime method of navigation (Christopher Columbus guided his ships using this tried-and-true method). It was (rightly) assumed that the sailors were relying too much on technology and that they had allowed real sailing talent to atrophy. The Chinese know this, and they've made plans to use these new weaknesses in the U.S. military to their advantage. Blinding or destroying a key navigation and communication satellite constellation, would do more than simply render a U.S. warship or unit militarily ineffective; it might very well cause its destruction before ever coming into contact with the enemy.

China has also had the gumption to invest in new technologies that many in the West scoff at. Things like the [EmDrive](#) or the [Quantum Internet satellite, Micius](#). In the case of the former, a British satellite engineer, Robert Shawyer, created a propulsion system meant for U.S. and British satellites that created thrust from nothing. This violated Newtonian physics causing the West to pooh-pooh it. China was more willing to try this unconventional propulsion than the British or the Americans. Some (myself included) worry that China successfully tested this technology in space already. If it works as advertised, then, the EmDrive would allow a manned spaceship to travel from the Earth to Mars in 70 days. Closer to home, it would allow satellites to have even stealthier maneuverability that would make them harder to track, disrupt,

or destroy. Or, it could allow for Chinese orbital weapons to float above our heads, hanging like a Damocles' Sword, without ever being detected.

With China's quantum internet satellite, no one in the West believed it was possible. The Chinese wanted a more secure form of instantaneous communication than what currently existed. So, their scientists used the theory of quantum entanglement to create an "un-hackable" communications network that will not only give China a key strategic advantage over the Americans, but if it is embraced by the rest of the world, it could become an alternative to today's U.S.-created internet. The strategic consequences of these advances are staggering. Sadly, few in the West are paying attention. President Trump's space force cannot come soon enough.

### When China Rules Space...

The Chinese have a plan for domination. They recognize the United States as their number one rival and are making moves to remove that perceived threat. Space is integral to their plans. In the near-term, the Chinese recognize the strategic advantages that America's dominant place in space has afforded Washington over the years. More ominously, however, Beijing has identified the inherent weaknesses of America's space architecture—and how that weakness will translate down to the rest of the force. China has made plans to exploit this

weakness with terminal intensity. Once the Americans have been displaced in orbit, the Chinese can then focus on fulfilling their industrial needs by coopting as much of the natural resources in the surrounding space as they can. Chinese behavior in Africa and in the South and East China Seas can give one a decent snapshot of where the Chinese are headed. As noted above, Beijing's leaders have already given us a clue as to what they are thinking: monopolization of rare resources for national gain.

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If space is a multi-trillion-dollar zone of economic activity, as many believe, then the country that captures the greatest share of those exploitable resources before any other country can will have decisive advantages on Earth. Imagine what China could do with the money made from their space mining endeavors in terms of military modernization and internal political stabilization. The Chinese Communist Party's vice-grip on power would be assured for at least another century, and the threat to the West would only grow to new, unmanageable levels.

For far too long American policymakers have ignored space. Now, the warning lights in Washington are flashing red...but few are paying attention. The Chinese know what they want; they have a strategy to get what they want—and that means knocking the United States out of orbit and preventing America from benefiting from the budding space mining industry. In every way imaginable, the Chinese have a clear-eyed understanding of

space and how best to use it to accomplish their goals on Earth. Few, if any, U.S. policymakers appear to. While the president's space force concept is one I fully support, the D.C. bureaucracy has worked assiduously to [stymie and undermine](#) this program. Yes, it is coming online. Unfortunately, it is not an independent force and will likely be too small and too beholden to the Air Force to make much of a difference. China, meanwhile, has already reorganized their forces to fight a space war.

Unless a Manhattan Project for a national military and economic space program is undertaken, the United States will surely lose its vaunted position in the strategic high ground to China (or another rising power). These other countries simply want space too much for it to be left in the ambivalent hands of America. If the United States loses space, and if it is not willing to fight to reclaim it, then America will become just another middling power on its way out, while being bullied by stronger, more resolved countries.

*In essence, you might not be interested in space, but space is interested in you.* Failure to understand the importance of space to both the military and to the economy will be America's undoing.

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