# US HEG PIC

## NC

### NC Shell – China

#### CP Text: {DEPENDS ON THE PLAN TEXT}

#### Chinese investments are catching up and the US needs private companies to maintain space dominance – Chinese space dominance risks extinction. Autry and Kwast 19:

Greg Autry, Steve Kwast {Greg Autry is a clinical professor of space leadership, policy, and business at Arizona State University’s Thunderbird School of Global Management. He served on the 2016 NASA transition team and as the White House liaison at NASA in 2017. He is the chair of the Safety Working Group for the U.S. Federal Aviation Administration’s Commercial Space Transportation Advisory Committee. Steve Kwast is a Lieutenant General and commander of Recruiting, Training, Educating and Development for the Air Force. He is an astronautical engineer and Harvard Fellow in Public Policy., }, 19 - ("America Is Losing the Second Space Race to China," Foreign Policy, 8-22-2019, https://foreignpolicy.com/2019/08/22/america-is-losing-the-second-space-race-to-china/)//marlborough-wr/

The current U.S. space defense strategy is inadequate and on a path to failure. President Donald Trump’s vision for a Space Force is big enough. As he said on [June 18](https://www.whitehouse.gov/briefings-statements/remarks-president-trump-meeting-national-space-council-signing-space-policy-directive-3/), “It is not enough to merely have an American presence in space. We must have American dominance in space.” But the Air Force is not matching this vision. Instead, the leadership is currently focused on incremental improvements to existing equipment and organizational structures. Dominating the vast and dynamic environment of space will require revolutionary capabilities and resources far deeper than traditional Department of Defense thinking can fund, manage, or even conceive of. Success depends on a much more active partnership with the commercial space industry— and its disruptive capabilities. U.S. military space planners are preparing to repeat a conflict they imagined back in the 1980s, which never actually occurred, against a vanished Soviet empire. Meanwhile, China is executing a winning strategy in the world of today. It is burning hard toward domination of the future space markets that will define the next century. They are planning infrastructure in space that will control 21st-century telecommunications, energy, transportation, and manufacturing. In doing so, they will acquire trillion-dollar revenues as well as the deep capabilities that come from continuous operational experience in space. This will deliver space dominance and global hegemony to China’s authoritarian rulers. Despite the fact that many in the policy and intelligence communities understand exactly what China is doing and have been trying to alert leadership, Air Force leadership has convinced the White House to fund only a slightly better satellite command with the same leadership, while sticking a new label onto their outmoded thinking. A U.S. Space Force or Corps with a satellite command will never fulfill Trump’s call to dominate space. Air Force leadership is demonstrating the same hubris that Gen. George Custer used in convincing Congress, over President Ulysses S. Grant’s better experience intuition, that he could overtake the Black Hills with repeating rifles and artillery. That strategy of technological overconfidence inflamed conflict rather than subduing it, and the 7th Cavalry were wiped out at the Battle of the Little Bighorn. The West was actually won by the settlers, ranchers, miners, and railroad barons who were able to convert the wealth of the territory itself into the means of holding it. They laid the groundwork that made the 20th century the American Century and delivered freedom to millions of people in Europe and Asia. Of course, they also trampled the indigenous people of the American West in their wake—but empty space comes with no such bloody cost. The very emptiness and wealth of this new, if not quite final, frontier, however, means that competition for resources and strategic locations in cislunar space (between the Earth and moon) will be intense over the next two decades. The outcome of this competition will determine the fate of humanity in the next century. China’s impending dominance will neutralize U.S. geopolitical power by allowing Beijing to control global information flows from the high ground of space. Imagine a school in Bolivia or a farmer in Kenya choosing between paying for a U.S. satellite internet or image provider or receiving those services for free as a “gift of the Chinese people.” It will be of little concern to global consumers that the news they receive is slanted or that searches for “free speech” link to articles about corruption in Western democracies. Nor will they care if concentration camps in Tibet and the Uighur areas of western China are obscured, or if U.S. military action is presented as tyranny and Chinese expansion is described as peacekeeping or liberation. China’s aggressive investment in space solar power will allow it to provide cheap, clean power to the world, displacing U.S. energy firms while placing a second yoke around the developing world. Significantly, such orbital power stations have dual use potential and, if properly designed, could serve as powerful offensive weapons platforms. China’s first step in this process is to conquer the growing small space launch market. Beijing is providing nominally commercial firms with government-manufactured, mobile intercontinental ballistic missiles they can use to dump launch services on the market below cost. These start-ups are already [undercutting](https://foreignpolicy.com/2019/04/02/beijing-is-taking-the-final-frontier-space-china/) U.S. pricing by 80 percent. Based on its previous success in using dumping to take out U.S. developed industries such as solar power modules and drones, China will quickly move upstream to attack the leading U.S. launch providers and secure a global commercial monopoly. Owning the launch market will give them an unsurmountable advantage against U.S. competitors in satellite internet, imaging, and power. The United States can still build a strategy to win. At this moment, it holds the competitive advantage in every critical space technology and has the finest set of commercial space firms in the world. It has pockets of innovative military thinkers within groups like the [Defense Innovation Unit](https://www.diu.mil/news-events), under Mike Griffin, the Pentagon’s top research and development official. If the United States simply protects the intellectual property its creative minds unleash and defend its truly free markets from strategic mercantilist attack, it will not lose this new space race. The United States has done this before. It beat Germany to the nuclear bomb, it beat the Soviet Union to the nuclear triad, and it won the first space race. None of those victories was achieved by embracing the existing bureaucracy. Each of them depended on the president of the day following the only proven path to victory in a technological domain: establish a small team with a positively disruptive mindset and empower that team to investigate a wide range of new concepts, work with emerging technologies, and test innovative strategies. Today that means giving a dedicated Space Force the freedom to easily partner with commercial firms and leverage the private capital in building sustainable infrastructure that actually reduces the likelihood of conflict while securing a better economic future for the nation and the world.

### NC Shell – Japan Prolif NB

#### The plan is a space shock that causes Asian arms races

Dean Cheng 9, Senior Research Fellow in the Asia Studies Center at the Heritage Foundation, Former Senior Analyst at the China Studies Division of the Center for Naval Analyses, Former Senior Analyst with Science Applications International Corporation, “Reflections On Sino-US Space Cooperation”, Space and Defense, Volume 2, Number 3, Winter 2009, https://www.usafa.edu/app/uploads/Space\_and\_Defense\_2\_3.pdf

Broader International Implications

Beyond the bilateral difficulties of cooperating with the PRC, it is also important to consider potential ramifications of Sino-US cooperation in space on the Asian political landscape. In particular, cooperation between Washington and Beijing on space issues may well arouse concerns in Tokyo and Delhi. Both of these nations have their own space programs, and while they are arguably not engaged in a “space race” with China (or each other), they are certainly keeping a close eye on developments regarding China. Of particular importance is Japan. The United States relationship with Japan is arguably its most important in East Asia. US interest in Japan should be self evident. Japan hosts 47,000 US troops and is the linchpin for forward US presence in that hemisphere. Japan is the second largest contributor to all major international organizations that buttress US foreign policy…. Japan is the bulwark for US deterrence and engagement of China and North Korea—the reason why those countries cannot assume that the United States will eventually withdraw from the region.35 For Japan, whose “peace constitution” forbids it from using war as an instrument of state policy, the United States is an essential guarantor of its security. Any move by the US that might undermine this view raises not only the prospect of weakening US-Japanese ties, but also potentially affecting Japan’s security policies. In this regard, then, it is essential not to engage in activities that would undercut perceptions of American reliability. Such moves, it should be noted, are not limited to those in the security realm. For example, the Nixon administration undertook several initiatives in the late 1960s and early 1970s that rocked Tokyo-Washington relations, and are still remembered as the “Nixon shocks.” While some of these were in the realm of security (including Nixon’s opening to China and the promulgation of the Nixon Doctrine), the others were in the trade area. These included a ten percent surcharge on all imports entering the US and suspended the convertibility of the dollar (i.e., removed the US from the gold standard).36 Part of the “shock” was the fundamental nature of these shifts. Even more damaging, however, was the failure of the Nixon Administration to consult their Japanese counterparts, catching them wholly off-guard. It took several years for the effects of these shocks to wear off. If the United States is intent upon expanding space relations with the PRC, then it would behoove it to consult Japan, in order to minimize the prospect of a “space shock.” Failing to do so may well incur a Japanese reaction. The decision on the part of Japan to build an explicitly intelligence-focused satellite was in response to the North Korean missile test of 1999, suggesting that Tokyo is fully capable of undertaking space-oriented responses when it is concerned.37 That, in turn, would potentially arouse the ire of China. The tragic history of Sino-Japanese relations continues to cast a baleful influence upon current interactions between the two states. If there is not a “space race” currently underway between Beijing and Tokyo, it would be most unfortunate if American actions were to precipitate one.

#### Japan will develop offensive strike---nuclear war

Kelly C. Wadsworth 19, Non-Resident Kelly Fellow at Pacific Forum at the Center for Strategic & International Studies, PhD Student in International Security Studies at the University of Pittsburgh, MBA and MA in International Studies (Korea Studies) at the University of Washington, Former Visiting Fellow at the Japan Institute of International Affairs, BA in International Relations and East Asia from the University of California, Davis, “Should Japan Adopt Conventional Missile Strike Capabilities?”, Asia Policy, Volume 14, Number 2, April 2019, p. 83-87

American proponents of Japan obtaining a conventional missile strike capability interviewed for this research argued that the United States could use a more capable ally in the region to address the threat posed by heightened Chinese naval activity. While that prospect might be a tempting short-term fix to offset the U.S. Department of Defense budget cuts over the last decade, the long-term interests of the United States in maintaining regional stability should also be considered. In addition to the negative reactions of Beijing and Seoul, a Japanese offensive strike capability could decrease regional confidence in the credibility of U.S. power in Asia. As noted above, some experts argue that if Japan strengthens its offensive capability, such a move might be interpreted by neighbors reliant on the U.S. nuclear umbrella as a sign that Tokyo is losing confidence in the United States’ credibility.71 This could start a chain reaction that causes more U.S. allies to hedge with China or to develop their own strike capabilities, further increasing instability in Asia. *China*. China would likely be the most vocal in its disapproval of a Japanese conventional missile strike capability, potentially offering not just harsh words but also harsh actions that could further decrease regional stability in an already tense security environment. China expressed dissent when Japan considered a preemptive strike option against the North Korean threat in 2006, arguing that the move was “extremely irresponsible” and would severely interfere with international diplomatic efforts, aggravating tensions in Northeast Asia.72 Over ten years later, the regional environment is even more tense as a result of North Korea’s acquisition of nuclear weapons and China’s island reclamation efforts in the East and South China Seas. Support from Washington for Tokyo’s armament would likely fuel Beijing’s narrative that an aggressive and hegemonic United States is fixated on containing China and would be used to justify China’s own increased militarization. It would likely also end any chance of dialogue between Washington and Beijing on facilitating peaceful resolutions to regional territorial disputes. Brad Roberts points out that adopting strike capability would assist Japan in cases where its interests do not align with those of the United States, as in potential gray-zone conflicts. 73 However, the ensuing heightened mistrust between the alliance partners and China may work to increase the likelihood of a gray-zone conflict—such as the 2010 collision of Japanese and Chinese boats in disputed territory—possibly escalating into war. In addition, if Japan had a conventional missile strike capability that could be used to “preempt” a perceived imminent attack from China, Beijing would in turn be more likely to consider preemption of Japanese strike abilities, causing a premature escalation of the crisis that would undoubtedly draw in the United States. *South Korea*. Despite significant progress on U.S.-ROK-Japan trilateral security cooperation in recent years, Japan-ROK military relations remain increasingly tense, a situation that could easily spiral out of control if Japan adopted an offensive capability.74 When Japan, sparked by North Korea’s provocations in 2006, publicly debated the legality of a “preemptive strike” option, South Korean officials bluntly expressed their negative opinion of Japan’s intentions. A spokesperson for the Blue House secretariat, for example, remarked, “We have been alerted by this display of Japan’s inclination to aggression,” and that Japan was using the crisis “as an excuse to beef up their military.”75 South Koreans demonstrated a similar sentiment after Tokyo’s 2014 CSD proposal, with a 2015 poll showing that the majority of the public (56.9%) perceived Japan as “militaristic,” up 3.8 percentage points from the previous year.76 If Tokyo were to push forward with the discussion of adopting a conventional missile strike capability, South Korean public opinion would likely become even more unfavorable toward Japan. At a time when enhanced trilateral cooperation is important to deter the evolving threats in the region, Japan advancing legislation to allow for conventional missile strike capabilities would likely derail those efforts, especially if labeled “preemptive.” Such a move could even push Seoul to hedge with Beijing, as the ROK is increasingly reluctant to join any initiative perceived to be aimed at containing China.77 With China as South Korea’s largest trading partner and the United States as its greatest security ally, the ROK is not eager to choose between the two sides. *Southeast Asia*. Countries in Southeast Asia are watching the Trump administration closely to see where Washington will draw the line on China’s military rise and growing regional assertiveness, and many are already hedging accordingly. For example, countries such as Vietnam and the Philippines are increasing their own conventional arsenal and naval capabilities as a result of Washington’s “slow erosion of credibility” in the region during the Obama administration.78 Defense of Japan 2018 seems to have confidence in the Trump administration’s commitment to maintaining a powerful presence in Asia.79 However, as discussed earlier, if Japan were to pursue an offensive defense strategy, the Southeast Asian countries could see this as a sign of Tokyo’s loss of faith in the United States’ willingness to uphold its defense commitments. China’s seizure of the Scarborough Shoal from the Philippines in 2012 has already eroded these countries’ confidence in the U.S. security guarantee to some extent.80 Declining credibility and corresponding hedging—through either growing armament or alignment with China—could not only further increase tensions and heighten the risk of a gray-zone escalation but also lead to greater Chinese military assertiveness and dominance in the region. *Summary* Despite the seemingly unbalanced nature of the U.S.-Japan alliance, the argument for “balancing” the alliance with Japan’s development of an independent conventional missile strike capability does not take into account important repercussions that could undermine both regional stability and U.S. credibility. In addition, updated Japanese defense guidelines, such as CSD, already give Japan a “greater role” in global security. Unless future U.S. administrations drastically reduce the U.S. military presence in Asia, the benefit of a more equal alliance would not outweigh the potential costs of Japan’s adoption of a conventional missile strike capability. CONCLUSION The arguments supporting Japan’s acquisition of a conventional missile strike capability do not hold weight in the current regional, economic, and alliance environments. The development of such a capability is not a practical solution for Japan to abate the threat from the DPRK, and the move could be perceived by China and South Korea as facilitating a U.S. strategy of containment. Traditional restrictions on the Japanese defense budget would not practically allow the buildup of the military capabilities required for a conventional missile strike force, a restriction that cannot be changed without support from a military-wary public. At first glance, a “normal” Japan that is capable of contributing to U.S. deterrence efforts might seem appealing from an alliance perspective, especially after the 2010 U.S. defense budget cuts, and an increasingly threatening regional security environment. Yet, though the U.S.-Japan alliance may be unbalanced in terms of capabilities, the United States has broader interests in regional stability that will be better promoted if Japan maintains a purely defensive force. A strike-capable Japan might not only escalate an already tense regional standoff with China but also elicit a harsh response from other countries against Tokyo and Washington. It could also erode the credibility of the U.S. nuclear umbrella, potentially leading to increased militarization throughout Asia. If the environment surrounding any of these three arguments changes—for example, if the United States’ actions discredit its reliability to protect Japan under the alliance, if Japanese public support allows an increase in the JSDF’s budget, or if the United States can no longer maintain a credible military deterrence in Asia—Japan would have a strong argument to move forward with conventional missile strike capabilities. In that case, both parties should exercise prudence in their public communications of planned alliance cooperation on the matter and about how or why the alliance would choose to employ such abilities. Hawkish suggestions of the potential to increase U.S. dominance in the region should be avoided.81 China is rightfully wary of any reference to conventional prompt global strike. Such rhetoric coming from Japan or the United States combined with the decision to move forward on conventional missile strike capabilities could be considered a threatening signal by Beijing.82 Without calculated prudence in regional dialogues, even the discussion of Tokyo acquiring conventional missile strike capabilities could ultimately worsen the regional security environment rather than improve it.

## Asteroid Mining DA

#### The private sector is essential for asteroid mining – competition is key and government development is not effective, efficient, or cheap enough. Thiessen 21:

Marc Thiessen, 6-1, 21, Washington Post, Opinion: SpaceX’s success is one small step for man, one giant leap for capitalism, https://www.washingtonpost.com/opinions/2020/06/01/spacexs-success-is-one-small-step-man-one-giant-leap-capitalism/

It was one small step for man, one giant leap for capitalism. Only three countries have ever launched human beings into orbit. This past weekend, SpaceX became the first private company ever to do so, when it sent its Crew Dragon capsule into space aboard its Falcon 9 rocket and docked with the International Space Station. This was accomplished by a company Elon Musk started in 2002 in a California strip mall warehouse with just a dozen employees and a mariachi band. At a time when our nation is debating the merits of socialism, SpaceX has given us an **incredible testament to the power of American free enterprise.** While the left is advocating unprecedented government intervention in almost every sector of the U.S. economy, from health care to energy, **today Americans are celebrating the successful privatization of space travel.** If you want to see the difference between what government and private enterprise can do, consider: It took a private company to give us the first space vehicle with touch-screen controls instead of antiquated knobs and buttons. It took a private company to give us a capsule that can fly entirely autonomously from launch to landing — including docking — without any participation by its human crew. It also took a private company to invent a reusable rocket that can not only take off but land as well. When the Apollo 11 crew reached the moon on July 20, 1969, Neil Armstrong declared “the Eagle has landed.” On Saturday, SpaceX was able to declare that the Falcon had landed when its rocket settled down on a barge in the Atlantic Ocean — ready to be used again. That last development will save the taxpayers incredible amounts of money. The cost to NASA for launching a man into space on the space shuttle orbiter was $170 million per seat, compared with just $60 million to $67 million on the Dragon capsule. The cost for the space shuttle to send a kilogram of cargo into to space was $54,500; with the Falcon rocket, the cost is just $2,720 — a decrease of 95 percent. And while the space shuttle cost $27.4 billion to develop, the Crew Dragon was designed and built for just $1.7 billion — making it the lowest-cost spacecraft developed in six decades. SpaceX did it in six years — far faster than the time it took to develop the space shuttle. ***The private sector does it better, cheaper, faster and more efficiently than government***. Why? Competition. Today, SpaceX has to compete with a constellation of private companies — including legacy aerospace firms such as Orbital ATK and United Launch Alliance and innovative start-ups such as Blue Origin (which is designing a Mars lander and whose owner, Jeff Bezos, also owns The Post) and Virgin Orbit (which is developing rockets than can launch satellites into space from the underside of a 747, avoiding the kinds of weather that delayed the Dragon launch). In the race to put the first privately launched man into orbit, upstart SpaceX had to beat aerospace behemoth Boeing and its Starliner capsule to the punch. It did so — for more than $1 billion less than its competitor. **That spirit of competition and innovation will revolutionize space travel in the years ahead.** Indeed, Musk has his sights set far beyond Earth orbit. Already, SpaceX is working on a much larger version of the Falcon 9 reusable rocket called Super Heavy that will carry a deep-space capsule named Starship capable of carrying up to 100 people to the moon and eventually to Mars. Musk’s goal — the reason he founded SpaceX — is to colonize Mars and make humanity a multiplanetary species. He has set a goal of founding a million-person city on Mars by 2050 complete with iron foundries and pizza joints. Can it be done? Who knows. But this much is certain: **Private-sector innovation is opening the door to a new era of space exploration**. Wouldn’t it be ironic if, just as capitalism is allowing us to explore the farthest reaches of our solar system, Americans decided to embrace socialism back here on Earth?

#### Space regulation scares investors away and spills over to other space activities.

Steven Freeland (BCom, LLB, LLM, University of New South Wales; Senior Lecturer in International Law, University of Western Sydney, Australia; and a member of the Paris-based International Institute of Space Law). “Up, Up and … Back: The Emergence of Space Tourism and Its Impact on the International Law of Outer Space.” Chicago Journal of International Law: Vol. 6: No. 1, Article 4. 2005. JDN. <https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1269&context=cjil>

V. THE NEED FOR CELESTIAL PROPERTY RIGHTS? ¶ The fundamental principle of "non-appropriation" upon which the international law of outer space is based stems from the desire of the international community to ensure that outer space remains an area beyond the jurisdiction of any state(s). Similar ideals emerge from UNCLOS (in relation to the High Seas) as well as the Antarctic Treaty, 42 although in the case of the latter treaty, it was finalised after a number of claims of sovereignty had already been made by various States and therefore was structured to "postpone" rather than prejudice or renounce those previously asserted claims.43 In the case of outer space, its exploitation and use is expressed in Article I of the Outer Space Treaty to be "the province of all mankind," a term whose meaning is not entirely clear but has been interpreted by most commentators as evincing the desire to ensure that any State is free to engage in space activities without reference to any sovereign claims of other States. This freedom is reinforced by other parts of the same Article and is repeated in the Moon Agreement (which also applies to "other celestial bodies within the solar system, other than the earth")." Even though both the scope for space activities and the number of private participants have expanded significantly since these treaties were finalised, it has still been suggested that the nonappropriation principle constitutes "an absolute barrier in the realization of every kind of space activity., 4 ' The amount of capital expenditure required to research, scope, trial, and implement a new space activity is significant. To bring this activity to the point where it can represent a viable "stand alone" commercial venture takes many years and almost limitless funding. From the perspective of a private enterprise contemplating such an activity, it would quite obviously be an important element in its decision to devote resources to this activity that it is able to secure the highest degree of legal rights in order to protect its investment. Security of patent and other intellectual property rights, for example, are vital prerequisites for private enterprise research activity on the ISS, and these rights are specifically addressed by the ISS Agreement between the partners to the project and were applicable to the experiments undertaken by Mark Shuttleworth when he was onboard the ISS.46

#### Asteroid mining can happen with private sector innovation and is key to solve a laundry list of impacts--climate change, economic decline and asteroid collisions. Taylor 19

Chris Taylor [journalist], 19 - ("How asteroid mining will save the Earth — and mint trillionaires," Mashable, 2019, accessed 12-13-2021, https://mashable.com/feature/asteroid-mining-space-economy)//ML

How much, exactly? We’re only just beginning to guess. [Asterank](http://www.asterank.com/" \t "_blank), a service that keeps track of some 6,000 asteroids in NASA’s database, prices out the estimated mineral content in each one in the current world market. More than 500 are listed as “>$100 trillion.” The estimated profit on just the top 10 asteroids judged “most cost effective” — that is, the easiest to reach and to mine, subtracting rocket fuel and other operating costs, is around $1.5 trillion.¶ Is it ours for the taking? Well, here’s the thing — we’re taking it already, and have been doing so since we started mining metals thousands of years ago. Asteroid strikes are the only reason rare metals exist in the Earth’s crust; the native ones were all sucked into our planet’s merciless iron core millions of years ago. Why not go to the source?¶ As a side project, space mining can grab water from the rocks and comets — water which, with a little processing makes rocket fuel. Which in turn makes even more currently unimaginable space operations possible, including ones that could give the planet all the energy it needs to avert climate catastrophe. Cislunar space — the bit around us and the moon, the local neighborhood, basically — is about to get very interesting.¶ It’s hard, even for the most asteroid-minded visionaries, to truly believe the full scope of this future space economy right now. Just as hard as it would have been in 1945, when an engineer named Vannevar Bush first proposed [a vast library of shared knowledge that people the world over would access via personal computers](https://en.wikipedia.org/wiki/Memex), to see that mushroom into a global network of streaming movies and grandmas posting photos and trolls and spies who move the needle on presidential elections. ¶ No technology’s pioneer can predict its second-order effects.¶ The space vision thing is particularly difficult in 2019. Not only do we have plenty of urgent problems with democracy and justice to keep us occupied, but the only two companies on the planet to have gone public with asteroid-mining business plans, startups that seemed to be going strong and had launched satellites already, were just bought by larger companies that are, shall we say, less comfortable executing on long-term visions.¶ Planetary Resources was founded in 2012 in a blaze of publicity. Its funding came from, among others, Larry Page, Eric Schmidt, Ross Perot, and the country of Luxembourg. It had inked an orbital launch deal with Virgin Galactic. And it was sold last October to a blockchain software company. (To 21st century readers, this paragraph would look like I’m playing tech world mad libs.)¶ In January, the other company, Deep Space Industries, also partly funded by Luxembourg (way to get in the space race, Luxembourg!), was sold to Bradford Space, owned by a U.S. investment group called the American Industrial Acquisition Corporation. Maybe these new overlords plan on continuing their acquisitions' asteroid mining endeavors rather than stripping the companies for parts. Both companies have been notably silent on the subject. “The asteroid mining bubble has burst,” [declared The Space Review](http://www.thespacereview.com/article/3633/1), one of the few online publications to even pay attention.¶ That’s also to be expected. After all, anyone trying to build Google in 1945 would go bankrupt. Just as the internet needed a half-dozen major leaps forward in computing before it could even exist, space industry needs its launch infrastructure.¶ Currently, the world’s richest person and its most well-known entrepreneur, Jeff Bezos and Elon Musk, respectively, are working on the relatively cheap reusable rockets asteroid pioneers will need. (As I was writing this, Bezos announced in an email blast that one of his New Shepherd rockets had flown to space and back five times like it was nothing, delivering 38 payloads for various customers while remaining entirely intact.) ¶ Meanwhile, quietly, Earth’s scientists are laying the groundwork of research the space economy needs. Japan’s Hayabusa 2 spacecraft has been in orbit around asteroid Ryugu for the last year and a half, learning everything it can. (Ryugu, worth $30 billion according to Asterank, is the website's #1 most cost-effective target.) The craft dropped [tiny hopping robot rovers](https://www.space.com/41941-hayabusa2-asteroid-rovers-hopping-tech.html) and a [small bomb](https://www.space.com/japan-hayabusa2-asteroid-bomb-video.html) on its target; pictures of the small crater that resulted were released afterwards.¶ Officially, the mission is to help us figure out how the solar system formed. Unofficially, it will help us understand whether all those useful metals clump together at the heart of an asteroid, as some theorize. If so, it’s game on for asteroid prospectors. If not, we can still get at the metals with other techniques, such as optical mining (which basically involves sticking an asteroid in a bag and drilling with sunlight; sounds nuts to us, but [NASA has proved it in the lab](https://www.nasa.gov/directorates/spacetech/niac/2017_Phase_I_Phase_II/Sustainable_Human_Exploration/)). It’ll just take more time.¶ Effectively, we’ve just made our first mark at the base of the first space mineshaft. And there’s more to come in 2020 when Hayabusa 2 returns to Earth bearing samples. If its buckets of sand contain a modicum of gold dust, tiny chunks of platinum or pebbles of compressed carbon — aka diamonds — then the Duchy of Luxembourg won’t be the only deep-pocketed investor to sit up and take notice.¶ The possibility of private missions to asteroids, with or without a human crew, is almost here. The next step in the process that takes us from here to where you are? Tell us an inspiring story about it, one that makes people believe, and start to imagine themselves mining in space. How would you explain the world-changing nature of the internet to 1945? How would you persuade them that there was gold to be mined in Vannevar Bush’s idea? You’d let the new economy and its benefits play out in the form of a novel.¶ As Hayabusa dropped a bomb on Ryugu, Daniel Suarez was making the exact same asteroid the target of his fiction. Suarez is a tech consultant and developer turned New York Times bestselling author. His novels thus far have been techno-thrillers: his debut, [Daemon](https://www.amazon.com/dp/B003QP4NPE/ref=dp-kindle-redirect?_encoding=UTF8&btkr=1), a novel of Silicon Valley’s worst nightmare, AI run rampant, made more than a million dollars.¶ So it was a telling shift in cultural mood that Suarez’s latest thriller is also a very in-depth description of — and thinly-disguised advocacy for — asteroid mining. In [Delta-v](https://www.amazon.com/Delta-v-Daniel-Suarez-ebook/dp/B07FLX8V84/ref=sr_1_1?crid=UMNUUSR3NCBX&keywords=delta-v&qid=1556930756&s=digital-text&sprefix=delta-v%2Cdigital-text%2C204&sr=1-1), published in April, a billionaire in the 2030s named Nathan Joyce recruits a team of adventurers who know nothing about space — a world-renowned cave-diver, a world-renowned mountaineer — for the first crewed asteroid mission.¶ Elon Musk fans might expect this to be Joyce’s tale, but he soon fades into the background. The asteroid-nauts are the true heroes of Delta-v. Not only are they offered a massive payday — $6 million each for four years’ work — they also have agency in key decisions in the distant enterprise. Suarez deliberately based them on present-day heroes. The mission is essential, Joyce declares, to save Earth from its major problems. First of all, the fictional billionaire wheels in a fictional Nobel economist to demonstrate the actual truth that the entire global economy is sitting on a [mountain of debt](https://www.washingtonpost.com/opinions/the-247-trillion-global-debt-bomb/2018/07/15/64c5bbaa-86c2-11e8-8f6c-46cb43e3f306_story.html?noredirect=on&utm_term=.5fb3ff1155d9). It has to keep growing or it will implode, so we might as well take the majority of the industrial growth off-world where it can’t do any more harm to the biosphere.¶ Secondly, there’s the climate change fix. Suarez sees asteroid mining as the only way we’re going to build [solar power satellites](https://en.wikipedia.org/wiki/Space-based_solar_power). Which, as you probably know, is a form of uninterrupted solar power collection that is theoretically more effective, inch for inch, than any solar panels on Earth at high noon, but operating 24/7. (In space, basically, it’s always double high noon). ¶ The power collected is beamed back to large receptors on Earth with large, low-power microwaves, which researchers think will be harmless enough to let humans and animals pass through the beam. A space solar power array like [the one China is said to be working on](https://www.forbes.com/sites/scottsnowden/2019/03/12/solar-power-stations-in-space-could-supply-the-world-with-limitless-energy/#2d3f78a54386) could reliably supply 2,000 gigawatts — or over 1,000 times more power than the largest solar farm currently in existence. ¶ “We're looking at a 20-year window to completely replace human civilization's power infrastructure,” Suarez told me, citing the report of the Intergovernmental Panel on Climate Change on the coming catastrophe. Solar satellite technology “has existed since the 1970s. What we were missing is millions of tons of construction materials in orbit. Asteroid mining can place it there.”¶ The Earth-centric early 21st century can’t really wrap its brain around this, but the idea is not to bring all that building material and precious metals down into our gravity well. Far better to create a whole new commodities exchange in space. You mine the useful stuff of asteroids both near to Earth and far, thousands of them taking less energy to reach than the moon. That’s something else we’re still grasping, how relatively easy it is to ship stuff in zero-G environments. ¶ Robot craft can move 10-meter boulders like they’re nothing. You bring it all back to sell to companies that will refine and synthesize it in orbit for a myriad of purposes. Big pharma, to take one controversial industry, would [benefit by taking its manufacturing off-world](https://medium.com/fitch-blog/why-is-big-pharma-interested-in-the-space-economy-c078ac1bf67c). The molecular structure of many chemicals grows better in microgravity.¶ The expectation is that a lot of these space businesses — and all the orbital infrastructure designed to support them — will be automated, controlled remotely via telepresence, and monitored by AI. But Suarez is adamant that thousands if not millions of actual human workers will thrive in the space economy, even as robots take their jobs in old industries back on Earth.¶ “Our initial expansion into space will most likely be unsettled and experimental. Human beings excel in such environments,” he says. “Humans can improvise and figure things out as we go. Robots must be purpose-built, and it's going to take time and experience for us to design and build them.”¶ Which is another way startups back on Earth will get rich in the new economy: designing and building those robots, the nearest thing to selling picks and shovels to prospectors in the space gold rush. Thousands of humans in space at any one time will also require the design and construction of stations that spin to create artificial gravity. Again, this isn’t a great stretch: Using centrifugal force to simulate gravity in space was first proposed by scientists in the 19th century. NASA has had workable designs for spinning cislunar habitats called [O’Neill cylinders](https://en.wikipedia.org/wiki/O%27Neill_cylinder) since the 1970s. We just haven’t funded them. ¶ But the trillionaires clearly will.¶ In short, Suarez has carefully laid out a vision of the orbital economy that offers something for everyone in our divided society. For Green New Deal Millennial

s, there’s the prospect of removing our reliance on fossil fuels at a stroke and literally lifting dirty industries off the face of the planet. For libertarians and other rugged individualists, there’s a whole new frontier to be developed, largely beyond the reach of government. ¶ For those who worry about asteroids that could wipe out civilization — though luckily, [this isn't likely to happen any time soon](https://mashable.com/article/armageddon-asteroid-threat) — here is a way for humanity to get proficient in moving them out of the way, fast. Indeed, the National Space Society has offered [a proposal](https://space.nss.org/technologies-for-asteroid-capture-into-earth-orbit/) to capture the asteroid Aphosis (which is set to miss Earth in the year 2029, but [not by a very comfortable margin](https://www.space.com/asteroid-apophis-2029-flyby-planetary-defense.html)), keep it in orbit, and turn it into 150 small solar-power satellites, as a proof of concept. ¶ For the woke folks who care about the bloody history of diamond production, there’s the likelihood that space mining would wipe out Earth’s entire diamond industry. “They will be found in quantities unattainable on Earth,” claims Suarez, with good reason. We are starting to discover that there is more crystalized carbon in the cosmos than we ever suspected. Astronomers have identified one [distant planet made entirely of diamond](https://www.nationalgeographic.com/science/phenomena/2014/06/24/diamond-the-size-of-earth/); there may be more, but they are, ironically, hard to see. ¶ We don’t have diamond planets in our solar system (and we can’t do interstellar missions), but we do have diamond-studded asteroids. Mine them for long enough and you will wear diamonds on the soles of your shoes.¶ For investors and entrepreneurs, there is the thrill of racing to be the first member of the four-comma club. ([Neil deGrasse Tyson believes that the first trillionaire will be an asteroid mining mogul](https://www.nbcnews.com/science/space/neil-degrasse-tyson-says-space-ventures-will-spawn-first-trillionaire-n352271); Suarez isn’t sure whether they’ll be the first, but he suspects that asteroid mining “will mint more trillionaires than any industry in history.”) ¶ For the regular guy or gal with a 401K, there’ll be a fast-rising stock market — inflated not by financial shenanigans this time, but an actual increase in what the world counts as wealth.¶ For workers, there is the promise of sharing in the untold riches, both legally and otherwise. It would be hard to stop miners attaining mineral wealth beyond their paycheck, under the table, when your bosses are millions of miles away. Then there’s the likelihood of rapid advancement in this new economy, where the miners fast gain the knowledge necessary to become moguls.¶ “After several tours in space working for others, perhaps on six-month or year-long contracts, it's likely that some workers will partner to set up their own businesses there,” says Suarez. “Either serving the needs of increasing numbers of workers and businesses in space, marketing services to Earth, or launching asteroid mining startups themselves.” All in all, it’s starting to sound a damn sight more beneficial to the human race than the internet economy is. Not a moment too soon. I’ve written encouragingly about asteroid mining several times before, each time touting the massive potential wealth that seems likely to be made. And each time there’s been a sense of disquiet among my readers, a sense that we’re taking our rapacious capitalist ways and exploiting space.¶ Whereas the truth is, this is exactly the version of capitalism humanity has needed all along: the kind where there is no ecosystem to destroy, no marginalized group to make miserable. A safe, dead space where capitalism’s most enthusiastic pioneers can go nuts to their hearts’ content, so long as they clean up their space junk. ¶ ([Space junk](https://mashable.com/category/space-junk) is a real problem in orbital space because it has thousands of vulnerable satellites clustered closely together around our little blue rock. The vast emptiness of cislunar space, not so much.)¶ And because they’re up there making all the wealth on their commodities market, we down here on Earth can certainly afford to focus less on growing our stock market. Maybe even, whisper it low, we can afford a fully functioning social safety net, plus free healthcare and free education for everyone on the planet.¶ It’s also clearly the area where we should have focused space exploration all along. If we settle on Mars, we may disturb as-yet-undiscovered native bacteria — and as the character Nathan Joyce shouts at a group of “Mars-obsessed” entrepreneurs in Delta-V, Mars is basically filled with toxic sand and is thus looking increasingly impossible to colonize. (Sorry, Mark Watney from The Martian, those potatoes would probably kill you.)

#### Warming causes extinction.

Bill McKibben 19, Schumann Distinguished Scholar at Middlebury College; fellow of the American Academy of Arts and Sciences; holds honorary degrees from 18 colleges and universities; Foreign Policy named him to their inaugural list of the world’s 100 most important global thinkers. "This Is How Human Extinction Could Play Out." Rolling Stone. 4-9-2019. https://www.rollingstone.com/politics/politics-features/bill-mckibben-falter-climate-change-817310/

Oh, it could get very bad. In 2015, a study in the Journal of Mathematical Biology pointed out that if the world’s oceans kept warming, by 2100 they might become hot enough to “stop oxygen production by phyto-plankton by disrupting the process of photosynthesis.” Given that two-thirds of the Earth’s oxygen comes from phytoplankton, that would “likely result in the mass mortality of animals and humans.” A year later, above the Arctic Circle, in Siberia, a heat wave thawed a reindeer carcass that had been trapped in the permafrost. The exposed body released anthrax into nearby water and soil, infecting two thousand reindeer grazing nearby, and they in turn infected some humans; a twelve-year-old boy died. As it turns out, permafrost is a “very good preserver of microbes and viruses, because it is cold, there is no oxygen, and it is dark” — scientists have managed to revive an eight-million-year-old bacterium they found beneath the surface of a glacier. Researchers believe there are fragments of the Spanish flu virus, smallpox, and bubonic plague buried in Siberia and Alaska. Or consider this: as ice sheets melt, they take weight off land, and that can trigger earthquakes — seismic activity is already increasing in Greenland and Alaska. Meanwhile, the added weight of the new seawater starts to bend the Earth’s crust. “That will give you a massive increase in volcanic activity. It’ll activate faults to create earthquakes, submarine landslides, tsunamis, the whole lot,” explained the director of University College London’s Hazard Centre. Such a landslide happened in Scandinavia about eight thousand years ago, as the last Ice Age retreated and a Kentucky-size section of Norway’s continental shelf gave way, “plummeting down to the abyssal plain and creating a series of titanic waves that roared forth with a vengeance,” wiping all signs of life from coastal Norway to Greenland and “drowning the Wales-sized landmass that once connected Britain to the Netherlands, Denmark, and Germany.” When the waves hit the Shetlands, they were sixty-five feet high. There’s even this: if we keep raising carbon dioxide levels, we may not be able to think straight anymore. At a thousand parts per million (which is within the realm of possibility for 2100), human cognitive ability falls 21 percent. “The largest effects were seen for Crisis Response, Information Usage, and Strategy,” a Harvard study reported, which is too bad, as those skills are what we seem to need most. I could, in other words, do my best to scare you silly. I’m not opposed on principle — changing something as fundamental as the composition of the atmosphere, and hence the heat balance of the planet, is certain to trigger all manner of horror, and we shouldn’t shy away from it. The dramatic uncertainty that lies ahead may be the most frightening development of all; the physical world is going from backdrop to foreground. (It’s like the contrast between politics in the old days, when you could forget about Washington for weeks at a time, and politics in the Trump era, when the president is always jumping out from behind a tree to yell at you.) But let’s try to occupy ourselves with the most likely scenarios, because they are more than disturbing enough. Long before we get to tidal waves or smallpox, long before we choke to death or stop thinking clearly, we will need to concentrate on the most mundane and basic facts: everyone needs to eat every day, and an awful lot of us live near the ocean. FOOD SUPPLY first. We’ve had an amazing run since the end of World War II, with crop yields growing fast enough to keep ahead of a fast-rising population. It’s come at great human cost — displaced peasant farmers fill many of the planet’s vast slums — but in terms of sheer volume, the Green Revolution’s fertilizers, pesticides, and machinery managed to push output sharply upward. That climb, however, now seems to be running into the brute facts of heat and drought. There are studies to demonstrate the dire effects of warming on coffee, cacao, chickpeas, and champagne, but it is cereals that we really need to worry about, given that they supply most of the planet’s calories: corn, wheat, and rice all evolved as crops in the climate of the last ten thousand years, and though plant breeders can change them, there are limits to those changes. You can move a person from Hanoi to Edmonton, and she might decide to open a Vietnamese restaurant. But if you move a rice plant, it will die. A 2017 study in Australia, home to some of the world’s highest-tech farming, found that “wheat productivity has flatlined as a direct result of climate change.” After tripling between 1900 and 1990, wheat yields had stagnated since, as temperatures increased a degree and rainfall declined by nearly a third. “The chance of that just being variable climate without the underlying factor [of climate change] is less than one in a hundred billion,” the researchers said, and it meant that despite all the expensive new technology farmers kept introducing, “they have succeeded only in standing still, not in moving forward.” Assuming the same trends continued, yields would actually start to decline inside of two decades, they reported. In June 2018, researchers found that a two-degree Celsius rise in temperature — which, recall, is what the Paris accords are now aiming for — could cut U.S. corn yields by 18 percent. A four-degree increase — which is where our current trajectory will take us — would cut the crop almost in half. The United States is the world’s largest producer of corn, which in turn is the planet’s most widely grown crop. Corn is vulnerable because even a week of high temperatures at the key moment can keep it from fertilizing. (“You only get one chance to pollinate a quadrillion kernels of corn,” the head of a commodity consulting firm explained.) But even the hardiest crops are susceptible. Sorghum, for instance, which is a staple for half a billion humans, is particularly hardy in dry conditions because it has big, fibrous roots that reach far down into the earth. Even it has limits, though, and they are being reached. Thirty years of data from the American Midwest show that heat waves affect the “vapor pressure deficit,” the difference between the water vapor in the sorghum leaf’s interior and that in the surrounding air. Hotter weather means the sorghum releases more moisture into the atmosphere. Warm the planet’s temperature by two degrees Celsius — which is, again, now the world’s goal — and sorghum yields drop 17 percent. Warm it five degrees Celsius (nine degrees Fahrenheit), and yields drop almost 60 percent. It’s hard to imagine a topic duller than sorghum yields. It’s the precise opposite of clickbait. But people have to eat; in the human game, the single most important question is probably “What’s for dinner?” And when the answer is “Not much,” things deteriorate fast. In 2010 a severe heat wave hit Russia, and it wrecked the grain harvest, which led the Kremlin to ban exports. The global price of wheat spiked, and that helped trigger the Arab Spring — Egypt at the time was the largest wheat importer on the planet. That experience set academics and insurers to work gaming out what the next food shock might look like. In 2017 one team imagined a vigorous El Niño, with the attendant floods and droughts — for a season, in their scenario, corn and soy yields declined by 10 percent, and wheat and rice by 7 percent. The result was chaos: “quadrupled commodity prices, civil unrest, significant negative humanitarian consequences . . . Food riots break out in urban areas across the Middle East, North Africa, and Latin America. The euro weakens and the main European stock markets lose ten percent.” At about the same time, a team of British researchers released a study demonstrating that even if you can grow plenty of food, the transportation system that distributes it runs through just fourteen major choke-points, and those are vulnerable to — you guessed it — massive disruption from climate change. For instance, U.S. rivers and canals carry a third of the world’s corn and soy, and they’ve been frequently shut down or crimped by flooding and drought in recent years. Brazil accounts for 17 percent of the world’s grain exports, but heavy rainfall in 2017 stranded three thousand trucks. “It’s the glide path to a perfect storm,” said one of the report’s authors. Five weeks after that, another report raised an even deeper question. What if you can figure out how to grow plenty of food, and you can figure out how to guarantee its distribution, but the food itself has lost much of its value? The paper, in the journal Environmental Research, said that rising carbon dioxide levels, by speeding plant growth, seem to have reduced the amount of protein in basic staple crops, a finding so startling that, for many years, agronomists had overlooked hints that it was happening. But it seems to be true: when researchers grow grain at the carbon dioxide levels we expect for later this century, they find that minerals such as calcium and iron drop by 8 percent, and protein by about the same amount. In the developing world, where people rely on plants for their protein, that means huge reductions in nutrition: India alone could lose 5 percent of the protein in its total diet, putting 53 million people at new risk for protein deficiency. The loss of zinc, essential for maternal and infant health, could endanger 138 million people around the world. In 2018, rice researchers found “significantly less protein” when they grew eighteen varieties of rice in high–carbon dioxide test plots. “The idea that food became less nutritious was a surprise,” said one researcher. “It’s not intuitive. But I think we should continue to expect surprises. We are completely altering the biophysical conditions that underpin our food system.” And not just ours. People don’t depend on goldenrod, for instance, but bees do. When scientists looked at samples of goldenrod in the Smithsonian that dated back to 1842, they found that the protein content of its pollen had “declined by a third since the industrial revolution — and the change closely tracks with the rise in carbon dioxide.” Bees help crops, obviously, so that’s scary news. But in August 2018, a massive new study found something just as frightening: crop pests were thriving in the new heat. “It gets better and better for them,” said one University of Colorado researcher. Even if we hit the UN target of limiting temperature rise to two degrees Celsius, pests should cut wheat yields by 46 percent, corn by 31 percent, and rice by 19 percent. “Warmer temperatures accelerate the metabolism of insect pests like aphids and corn borers at a predictable rate,” the researchers found. “That makes them hungrier[,] and warmer temperatures also speed up their reproduction.” Even fossilized plants from fifty million years ago make the point: “Plant damage from insects correlated with rising and falling temperatures, reaching a maximum during the warmest periods.”

## Case

#### Definition of private entity.

Cornell law, ND - ("Definition: private entity from 6 USC § 1501(15)(A)," Cornell, ND, 12-1-2021https://www.law.cornell.edu/definitions/uscode.php?width=840&amp;height=800&amp;iframe=true&amp;def\_id=6-USC-625312480-168358316&amp;term\_occur=999&amp;term\_src=title:6:chapter:6:subchapter:I:section:1501)//AW

In general Except as otherwise provided in this paragraph, the term “private entity” means any person or private group, organization, proprietorship, partnership, trust, cooperative, corporation, or other commercial or nonprofit entity, including an officer, employee, or agent thereof.

Prefer our def.

Means that colab w/ gov doesn’t make private entities public.

AND they don’t fiat collab, so they can’t solve and definitely link to da.

Private approp not illegal

## Generic Turns

### Tech Impact Turn

#### Turn - private space exploration is key to solve all of the aff’s impacts. Rumende 21:

Thevnin Rumende {mechanical engineering junior and Community Voices columnist, }, 21 - ("Opinion: Critics are overlooking the technological benefits of the billionaire space race," Shorthorn, 9-14-2021, https://www.theshorthorn.com/opinion/opinion-critics-are-overlooking-the-technological-benefits-of-the-billionaire-space-race/article\_4cd73e2e-1512-11ec-874b-bb7e3009729b.html)//marlborough-wr/

There has been no shortage of opinion surrounding what has been derisively dubbed by some as the “pointless billionaire space race.” Pundits have not hesitated to express their ire toward what they view as a new pet project for billionaires. Despite the controversy that accompanies the uber-wealthy’s interest in the private space industry, this development and its effects deserve to be treated with more nuance. When discussing the topic of billionaires in space, the hatred and distrust toward these individuals often trumps any positive technological advancements their companies have achieved on the path to civilian space flight. Simply labeling their endeavors in commercial space flight “a rich person’s ‘joyride’” undercuts the sheer immensity of safely ferrying a person to and from the edge of space, and in the case of SpaceX, a private space manufacturer, having docked and undocked with the international space station in low-Earth orbit. While viewing the success of the current era of space transportation, one might overlook the fact that of the 355 astronauts who flew aboard NASA’s space shuttles from 1981 to 2011, 14 were killed. Simply put, many things can and have gone wrong when attempting to enter space, and any step taken closer to a safer launch system benefits all of humanity. However, for some people, they view the contest of private space companies as “a tragically wasteful ego contest,” a distraction from more pressing issues such as proliferating climate catastrophes, inequality, lack of health care and insufficient housing. This view is shortsighted as it fails to recognize the key role space is already playing in combating a host of the aforementioned crises. According to the World Economic Forum, space technology is helping end hunger by imaging vast swathes of agricultural land and by helping produce agricultural indexes, along with ensuring people access to clean water through the monitoring of reservoirs via satellite images. Cheaper and more efficient space launch systems mean deploying even more satellites to help better address these problems.

The microgravity environment of space could potentially allow the fabrication of human organs using a 3D bioprinter. With the demand for yearly organ transplants dwarfing the supply, manufacturing organs in space would help address the overwhelming needs of medical patients. The most common contention leveled against these “space billionaires” is that the wealth they accumulate through their endeavors will only serve to enrich them, widening the gap between the haves and the have nots. While these concerns are natural, they often overlook technology’s profound ability to democratize knowledge and reshape society for the better. The private space industry has already significantly reduced the capital investment necessary to embark on projects such as internet satellite constellations. Satellite internet providers have long promised the ability to provide secure internet connectivity to the remaining 3.7 billion unconnected people on the earth, but only now is it attainable. With current technology, nearly a third of the human population could access secure financial accounts and the vast library of human knowledge, once restricted to more developed nations, in under a decade. The significance of these two effects alone toward the advancement of humanity, which could be further advanced through private interests in space, would be incalculable. Like the creation of the internet and the opening of the western frontier in the U.S., the impact that the opening of space will have on the course of humanity is unforeseeable. But the impact is sure to be monumental. We shouldn’t let our distaste of certain billionaires cloud our view of the path that lies ahead. Just as the robber barons of yesteryear played a large role in shaping the nation but are now long forgotten, so too will Jeff Bezos, Elon Musk and Sir Richard Branson.

### CHP Fails—Psychology

#### The common heritage principle is an impossible ideal that doesn’t match human psychology

Buxton 4 Carol R. Buxton (Administrative Lawyer). “Property in Outer Space: The Common Heritage of Mankind Principle vs. the First in Time, First in Right, Rule of Property.” 69 Journal of Air, Law, and Commerce, 689 (2004). JDN. https://scholar.smu.edu/jalc/vol69/iss4/3

Despite the fierce intent of the international community, full acceptance of the common heritage principle will come slowly, if at all. Though evolution shapes life, such progression requires time. Life on earth shows that physical evolution results when a need arises. However, man's broad acceptance of a common heritage approach to land and its resources demands a psychological evolution rather than a physical change mandated by his environment. Man seems incapable of such change; consequently, psychological evolution will require intense, long-lasting global effort. The international community cannot reverse thousands of years of behavior in one generation. Ancient, nomadic man fought over land resources when permanent occupation of a single area proved impossible due to the essential pursuit of food. Later, when farming and agriculture replaced nomadic existence, man fought over the land itself-as well as its resources. As technology advances, this pattern will continue into space and other previously uninhabitable areas on earth.

### CHP Fails—Empirics

#### The common heritage principle has failed in the context of maritime disputes

Buxton 4

Carol R. Buxton (Administrative Lawyer). “Property in Outer Space: The Common Heritage of Mankind Principle vs. the First in Time, First in Right, Rule of Property.” 69 Journal of Air, Law, and Commerce, 689 (2004). JDN. https://scholar.smu.edu/jalc/vol69/iss4/3

Unfortunately, the vague reference to the common heritage of mankind ideal fails to settle the dispute between the developed and less-developed nations. Although the Third Law of the Sea Convention advocates "for the equitable sharing of financial and other economic benefits derived from activities in the [a]rea[,]" the dispute between nations continues.3 1 "Equitable" seems synonymous with "fair;" therefore, a literal interpretation of this provision would suggest that financial and economic benefits would be proportionate to the economic, scientific, or technological effort put forth by each state.12 "Equal," however, means equivalent or identical.3 3 A literal interpretation of this would imply that financial or economic benefits would be divided among all states, regardless of effort or input of each' state.3 4 Because the United States objects to the latter interpretation, it refused to sign the seabed agreement; instead, along with other developed nations, the United States established its own system for regulating seabed exploitation.3 5

### CHP Vague

#### Circumvention: The common heritage principle is legally unclear, which ensures cheating

Reinstein 99

Ezra J. Reinstein (JD, Associate at Kirkland & Ellis), Owning Outer Space, 20 Nw. J. Int'l L. & Bus. 59 (1999). JDN. https://scholarlycommons.law.northwestern.edu/njilb/vol20/iss1/7

The Outer Space Treaty also states, in article I, that space is "the province of all mankind." In what way does this phrase limit the ways that space can be explored and used? The difficulty is that "mankind" is not a defined term in international law. 6 As Adrian Buekling observes, the use of the term "mankind" causes "the relevant clauses of the Space Treaty [to] offer little guidance as to what states may derive from them. Neither can it be satisfactorily established what rights a state not involved in space exploration might have in the achievements of the space powers. '7 The U.N. Convention of the Law of the Sea ("LOS") describes the deep sea-bed in similar terms, as the "common heritage of mankind."58 The meaning of this clause, similar in wording and character to that in the OST, is likewise unclear; "depending on the interpretation accepted, the unilateral exploitation of the resources of the deep sea-bed may or may not be permissible... '59

### CHP Negates

#### Private ownership is the best way to fulfill the common heritage principle

Reinstein 99

Ezra J. Reinstein (JD, Associate at Kirkland & Ellis), Owning Outer Space, 20 Nw. J. Int'l L. & Bus. 59 (1999). JDN. https://scholarlycommons.law.northwestern.edu/njilb/vol20/iss1/7

A. Three Arguments for Ownership ¶ Space is an international zone, and so is, in a sense, the heritage of all humanity. We must not forget, when considering the governance of outer space, that the rules should first and foremost attempt to maximize the benefit to all humankind. So, ideally, celestial bodies should be put to the uses most beneficial to humanity. This is guaranteed by a system that puts land in the hands of those for whom the territory is most profitable. It is a matter of elementary economic theory. Whoever can use a site to humanity's greatest benefit will be the one who can profit most from the site; whoever can profit most from the site will be the one for whom the site is most valuable. Thus the person who can put a site to humanity's greatest benefit will be the one willing to spend the most to own the site.84 This is the bargain theory of economics, and will form the basis for all that follows.

## Colonization

### Impact Turns

#### Every delay kills trillions of humans

Bostrom 3 – Department of Philosophy, Yale University, Director of the Future of Humanity Institute at Oxford University, 2002 (Nick, “Astronomical Waste: The Opportunity Cost of Delayed Technological Development,” Preprint, Utilitas Vol. 15, No. 3, pp. 308-314, http://www.nickbostrom.com/astronomical/waste.html)

As I write these words, suns are illuminating and heating empty rooms, unused energy is being flushed down black holes, and our great common endowment of negentropy is being irreversibly degraded into entropy on a cosmic scale. These are resources that an advanced civilization could have used to create value-structures, such as sentient beings living worthwhile lives. The rate of this loss boggles the mind. One recent paper speculates, using loose theoretical considerations based on the rate of increase of entropy, that the loss of potential human lives in our own galactic supercluster is at least ~10^46 per century of delayed colonization.[1

] This estimate assumes that all the lost entropy could have been used for productive purposes, although no currently known technological mechanisms are even remotely capable of doing that. Since the estimate is meant to be a lower bound, this radically unconservative assumption is undesirable. We can, however, get a lower bound more straightforwardly by simply counting the number or stars in our galactic supercluster and multiplying this number with the amount of computing power that the resources of each star could be used to generate using technologies for whose feasibility a strong case has already been made. We can then divide this total with the estimated amount of computing power needed to simulate one human life. As a rough approximation, let us say the Virgo Supercluster contains 10^13 stars. One estimate of the computing power extractable from a star and with an associated planet-sized computational structure, using advanced molecular nanotechnology[2], is 10^42 operations per second.[3] A typical estimate of the human brain’s processing power is roughly 10^17 operations per second or less.[4] Not much more seems to be needed to simulate the relevant parts of the environment in sufficient detail to enable the simulated minds to have experiences indistinguishable from typical current human experiences.[5] Given these estimates, it follows that the potential for approximately 10^38 human lives is lost every century that colonization of our local supercluster is delayed; or equivalently, about 10^31 potential human lives per second. While this estimate is conservative in that it assumes only computational mechanisms whose implementation has been at least outlined in the literature, it is useful to have an even more conservative estimate that does not assume a non-biological instantiation of the potential persons. Suppose that about 10^10 biological humans could be sustained around an average star. Then the Virgo Supercluster could contain 10^23 biological humans. This corresponds to a loss of potential equal to about 10^14 potential human lives per second of delayed colonization. What matters for present purposes is not the exact numbers but the fact that they are huge. Even with the most conservative estimate, assuming a biological implementation of all persons, the potential for one hundred trillion potential human beings is lost for every second of postponement of colonization of our supercluster.[6]