## China private public t

#### Interpretation: the affirmative must only defend that the appropriation of space by private entities is unjust.

#### A private entity is not affiliated with the government

UpCounsel ND (UpCounsel, Private Entity: Everything You Need to Know, <https://www.upcounsel.com/private-entity>) SJ

A private entity can be a partnership, corporation, individual, nonprofit organization, company, or any other organized group that is not government-affiliated Indian tribes and foreign public entities are not considered private entities. Unlike publicly traded companies, private companies do not have public stock offerings on Nasdaq, American Stock Exchange, or the New York Stock Exchange. Instead, they offer shares privately to interested investors, who may trade among themselves.

#### The private entities they talk about are government affiliated and get money from the government

In their patel 21 card:

, the Chinese government decided to treat civil space development as a key area of innovation, as it had already begun doing with AI and solar power. It issued a policy directive called Document 60 that year to enable large private investment in companies interested in participating in the space industry.

#### China's "private" sector companies aren't private

Olson 20 [Stephen Olson, research fellow at the Hinrich Foundation. "Are Private Chinese Companies Really Private?" The Diplomat, 9-30-2020, accessed 1-14-2022, https://thediplomat.com/2020/09/are-private-chinese-companies-really-private/] HWIC

China has often been criticized for a lack of transparency, especially with regard to its economic and trade policies. While in many cases these criticisms are valid, it belies the fact that in other instances, China is remarkably open and transparent about its intentions and ambitions.

Such is the case with China’s “Opinion on Strengthening the United Front Work of the Private Economy in the New Era,” recently released by the Central Committee of the Chinese Communist Party (and further elaborated on by President Xi Jinping himself). This document tells us in no uncertain terms that Chinese private companies will be increasingly called upon to conduct their operations in tight coordination with governmental policy objectives and ideologies. The rest of the world should take note.

A Different Vision of “Private” Business

The 5,000 word “opinion” aims to ratchet-up the role and influence of the CCP within the private sector in order “to better focus the wisdom and strength of the private businesspeople on the goal and mission to realize the great rejuvenation of the Chinese nation.” The objective is to establish a “united front” between business and government and facilitate the “enhancement of the party’s leadership over the private economy.” According to the plan, “private economic figures are to be more closely united around the party,” thereby achieving “a high degree of consistency with the Party Central Committee on political stand, political direction, political principles, and political roads.”

All of this stands in stark contrast to long-accepted concepts of how private companies function in a free market. The overriding purpose of business, according to these traditional precepts, is to earn profits through the provision of value-added products and services, in response to marketplace signals and under the constraint of basic economic realities. Government ideology plays no role in that equation.

But China has a very different vision. Government officials and government ideologies are directly infused into business operations. Private sector employees are “educated” on government policies and ideologies, with the expectation that this “enlightenment” will help inform their business decisions. This government-business symbiosis is further cemented by the provision of massive government subsidies (estimated to be about 3 percent of China’s GDP) to Chinese companies.

#### 1-- they skirt the core controversy of the topic which is national vs private space activities – kills stasis point and pre-round prep and means we lose access to generics that rely on the motives of private companies differing from national interest proven by the fact that their advantage is functionally China space good/bad

**Standards**

**2 – clash – the aff leads to two ships passing in the night bc the neg doesn’t have substantive, well-researched objections to the aff. kills education bc we never learn anything about both sides of the topic – aff is more likely to win bc they’re ahead on the research about their specific type of appropriation.**

**Voters –**

**1 -- Fairness – you need fairness to evaluate debate rounds – the judge needs to vote for the better debater not the better cheater.**

**2 – education – it’s a voter because it’s the reason schools fund debate and the only portable skills we gain from debate are a result of education – knowing how to discuss the merits of broad policy options has more real world implications than knowing how to go for an rvi or knowing how to defend policies that are so obscure they’d never be passed.**

**Paradigm issues –**

**1 – No RVIs**

**a] logic – you don’t get to win just for proving you’re topical**

**b] chilling effect – rvis disincentivize debaters from checking abuse**

**c] theory baiting – rvis incentivize affs to be as unnegatable as possible so they can bait t or theory and win**

**2 – competing interpretations over reasonability**

**a] arbitrariness – reasonability is arbitrary and invites judge intervention**

**b] brightlines mean competing interps – it becomes a debate of whose brightline is best which is the same thing as competing interps – you’re debating about whose model is best**

**3 – drop the debater**

**a] logic – drop the argument doesn’t make sense – the shell indics their entire advocacy**

**b] severance – if they go for drop the argument it’s severance and an independent reason to negate – kicking out of the aff no-links all neg offense and forces us to restart and finish the debate in the 2nr**

## Ptd t

#### Interpretation: the affirmative must only garner offense from PTD

#### Violation: they garner offense from \_\_\_

#### PTD is the simplest method + solves the majority of impacts

**Babcock 2019** (Hope M. Babcock, “The Public Trust Doctrine, Outer Space, and the Global Commons: Time to Call Home ET,” Syracuse Law Review, Vol. 69, No. 2, 2019, <https://scholarship.law.georgetown.edu/cgi/viewcontent.cgi?article=3219&context=facpub>) //neth

The doctrine also appears to be infinitely malleable. Original uses of the doctrine were restricted to only that “aspect of the public domain below the low-water mark on the margin of the sea and the great lakes, the waters over those lands, and the waters within rivers and streams of any consequence,”520 and covered only traditional uses of those lands, like fishing and navigation.521 Over time, the scope and application of the doctrine broadened to protect more public resources and different uses.522 Thus, the doctrine expanded to protect new trust resources, such as dry sand beaches, inland lakes, groundwater, dry riverbeds, and wildlife,523 and passive uses of those resources, like scientific study.524 The original link to navigable water and tidelands disappeared.525 Supporters of the doctrine successfully advocated that it be applied to “wildlife, parks, cemeteries, and even works of fine art,”526 while arguing more recently its application to the atmosphere.527 A doctrine that imposes a perpetual duty on the sovereign to preserve trust resources, prevents their alienation for private benefit, assures public access to them, and can be invoked by anyone seems particularly useful as a management tool in outer space.528 The fact that public access to trust resources is so central to the doctrine makes it reflective, not contradictory, of international space law’s bar against appropriation of outer space and of the principle of space being the “province of all mankind.”529 It avoids the problems of alienation and exclusion associated with any of the management approaches associated with some form of private property and requires neither the creation of a new administrative authority nor the presence of a close-knit group of like-minded people.530 Members of the public, both rich and poor, can invoke and enforce the doctrine as easily as the sovereign.531 It is cost effective to the extent that no separate apparatus is required to implement it, and the doctrine has shown itself to be highly adaptable and innovative as different needs arise.532 It could also fill the gap in international law with respect to managing celestial property. Therefore, of all the management approaches studied here, the PTD seems the most suited to keep order in space until a regulatory regime is imposed. However, the doctrine provides no incentives for development of trust resources; rather, it might be used to limit or curtail that development, making it an imperfect, perhaps even counter-productive solution by itself to the extent that such development might be beneficial.533 Modifying the doctrine to allow limited use of private property management approaches, like tradable development claims, might buffer that effect—a form of overlapping hybridity between one type of property, a commons, and a management regime from another, private property, enabled by application of the PTD. CONCLUSION “Only a legal system that accommodates both the human need for resources and the necessary preservation of mankind’s common heritage can fulfill these criteria.”534 The future is now with regard to the development of outer space and its resources—it is no longer a question of whether humans will engage in these activities, but how soon they will. Technically advanced countries and private commercial enterprises are probing outer space and preparing for landing on an asteroid or the moon to extract their resources.535 Speculators are selling deeds to the moon’s surface and preparing to exploit the tourism potential that space offers.536 But, the legal framework for managing these initiatives is almost nonexistent.537 International treaties came into being before all this activity began in earnest and national laws that might apply are stunted by jurisdictional quandaries like the absence of national boundaries in outer space.538 Thus, there is an urgency to figure out how to control what happens in outer space before its resources are irreparably damaged or permanently monopolized by powerful countries and individuals. In the absence of regulation, much of the current debate centers on what property regime should be applied in outer space.539 The assumption is that by only allowing private property rights in space, countries and commercial enterprises will undertake the risks and costs of space development.540 However, unless international space law changes, it may prevent this from happening. If it changes, strong management controls will be necessary to prevent destruction or over-consumption of celestial resources, as well as monopolization and competitive behavior by participants, which could lead to hostilities and inequities. This Article examines various private property regimes, including those of less than full fee ownership, to see if any would avoid the conflict with the international prohibition on appropriation of outer space and its resources. It concludes that none will because each retains the right to exclude and each is insensitive to the treaties’ equity concerns. In contrast, considering outer space to be common is consistent with international space law in both respects. Hypothesizing that private property in outer space may yet prevail, this Article investigates different private property management approaches, such as the right of first possession, lotteries, and tradable development rights, to see if any would be cost effective, easy to implement and equitable, and would also prevent over-consumption, monopolization or the slide into rivalrous behavior. The Article concludes that each comes up short in some respect. Social norms as a management tool for property held in common, although compliant with international law, are also not up to the task. Instead, although ancient, the PTD, with its malleability, easy and cost-effective implementation and enforcement, non-consumption principle, and consistency with the goals that animate international space treaties, seems best suited to the task of protecting the public’s interests in the global commons that is outer space as it has done for centuries in Earth-bound commons. But, as its principal terrestrial use has been to protect trust resources from development, the doctrine needs some modification to encourage development of celestial resources. Hence, this Article suggests that modifying the PTD to allow the application of private property management tools, like tradable development rights, will not only allow development, but also will assure that when it happens, it will not be just profitable for a few, but will also be sustainable and equitable.

#### Standards

#### predictability – PTD was a core aff when college policy debated a similar topic – proves that it’s at the core of the topic AND it’s what most debaters will prep against – teams use past instances of similar topics as a starting point for prep. And our model is better for small schools bc it means there’s already answers to the aff disclosed on the college policy wiki

#### Ca paradigm issues

## disad

#### Xi is tightening control over the PLA but completing goals are critical.

Krishnan 21 – Ananth, 11/18/21, [‘Xi tightened control over the PLA’, TheHindu, <https://www.thehindu.com/news/international/xi-tightened-control-over-the-pla/article37549460.ece>] Justin

The new resolution on history passed last week by China’s ruling Communist Party has said that President Xi Jinping had tightened control over the military to address the party’s “obviously lacking” leadership of the armed forces under his predecessors.

The full text of the resolution, released on Tuesday evening, listed some of the actions taken by the People’s Liberation Army (PLA) under Mr. Xi, who is also the chairman of the Central Military Commission. These included what the document described as “major operations related to border defence”.

No specifics

It did not specify what those major operations were. China has unresolved land borders with India and Bhutan. In April 2020, the PLA mobilised two divisions and carried out multiple transgressions across the Line of Actual Control (LAC) in Eastern Ladakh, sparking the worst crisis along the border in many years. Talks to resolve the tensions are still on-going.

“The armed forces have remained committed to carrying out military struggles in a flexible manner to counter military provocations by external forces, and they have created a strong deterrent against separatist activities seeking ‘Taiwan independence,’” the resolution said.

“They have conducted major operations related to border defence, protecting China’s maritime rights, countering terrorism and maintaining stability, disaster rescue and relief, fighting COVID-19, peacekeeping and escort services, humanitarian assistance, and international military cooperation.”

Last week’s resolution on history was only third such document putting forth the official view on party history, following resolutions passed by Mao Zedong in 1945 and Deng Xiaoping in 1981.

The new resolution dealt more with the future than the past. It essentially reaffirmed the official view on history, saying that the “basic points and conclusions” of past resolutions “remain valid to this day.”

It repeated the conclusion reached in 1981 on Mao’s errors noting that “mistakes were made” and that “Mao Zedong’s theoretical and practical errors concerning class struggle in a socialist society became increasingly serious” leading to the disasters of the Cultural Revolution.

Criticism of predecessors

Much of the new resolution focuses on emphasising Mr. Xi’s leadership and calling for the party to support his “core” status. It only briefly mentioned Mr. Xi’s predecessors Jiang Zemin and Hu Jintao, and implicitly critcised some aspects of their leadership including on military matters.

“For a period of time, the party’s leadership over the military was obviously lacking,” it noted. “If this problem had not been completely solved, it would not only have diminished the military’s combat capacity, but also undermined the key political principle that the party commands the gun.”

The document said Mr. Xi’s leadership had tightened supervision on the military including boosting “troop training and battle preparedness”, and it repeated China’s stated goals of completing the modernisation of its armed forces by 2035 and building a “world class” military by 2050, which observers see as meaning on par with the U.S.

‘Working vigorously’

“To build strong people’s armed forces, it is of paramount importance to uphold the fundamental principle and system of absolute party leadership over the military, to ensure that supreme leadership and command authority rest with the party Central Committee and the Central Military Commission (CMC), and to fully enforce the system of the CMC chairman assuming overall responsibility,” the resolution said, adding that “setting their sights on this problem, the Central Committee and the CMC have worked vigorously to govern the military with strict discipline in every respect.”

#### The commercial space sector is one of the PLAs central goals – the plan is a 180 and circumvents.

Bartholomew & Cleveland 19 – Carolyn and Robin, 4/25/19, Chairmen and Vice Chairmen. Section is written from Michael A. McDevitt, US Congressperson, [“HEARING ON CHINA IN SPACE: A STRATEGIC COMPETITION?,” <https://www.uscc.gov/sites/default/files/transcripts/April%2025%2C%202019%20Hearing%20Transcript%20%282%29.pdf>] Justin

As the Chairman said, China is determined to become a leading space power, which requires continuing to boost its innovation capabilities, both in its civilian and military sectors. The People’s Liberation Army is closely involved in most if not every aspect of China’s space program, from helping formulate and execute national space goals to overseeing China’s human spaceflight program. Coverage of China’s space program must treat seriously the implications of the reality that in many cases the boundaries between the military and civil silos of China’s program are thin, if they exist at all.

Our second panel today will address the application of what China calls its “military-civil fusion” strategy to its space sector. Military-civil fusion, a strategic concept designed to harness civilian sector innovation to power China’s military and technological modernization with the goal of leapfrogging the United States and becoming a technological powerhouse. Space has been designated as an especially important sector for military-civil fusion, and the impacts of this campaign on China’s burgeoning commercial space sector—itself a recipient of generous government support and protection—will be crucial as Chinese companies increasingly seek to compete in the international marketplace. Military-civil fusion is especially worthy of attention due to its continued reliance on technology transfer, by hook or by crook, to fuel China’s industrial and military growth.

Our third and final panel today will examine China’s military space and counterspace activities. Since its direct-ascent kinetic antisatellite test in 2007, which was responsible for a large amount of all space debris currently in Earth’s orbit, China has continued to invest in a variety of offensive antisatellite capabilities. Indeed, China’s counterspace arsenal contains many options: earlier this month, Acting Secretary of Defense Patrick Shanahan said China “has exercised and continues to develop” jamming capabilities; is deploying directed-energy counterspace weapons; has deployed an operational ground-based antisatellite missile system; and is prepared to use cyberattacks against U.S. space systems.

#### That triggers backlash – they don’t support restrictions on the space sector and will do everything to convince leaders not to do the plan.

Cheng 14 [Dean Cheng, 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, “Prospects for U.S.-China Space Cooperation”, Testimony before the Committee on Commerce, Science, and Transportation, United States Senate, 4/9/2014, https://www.heritage.org/testimony/prospects-us-china-space-cooperation]

At the same time, space is now a sector that enjoys significant political support within the Chinese political system. Based on their writings, the PLA is clearly intent upon developing the ability to establish “space dominance,” in order to fight and win “local wars under informationized conditions.”[8] The two SOEs are seen as key parts of the larger military-industrial complex, providing the opportunities to expose a large workforce to such areas as systems engineering and systems integration. It is no accident that China’s commercial airliner development effort tapped the top leadership of China’s aerospace corporations for managerial and design talent.[9] From a bureaucratic perspective, this is a powerful lobby, intent on preserving its interests. China’s space efforts should therefore be seen as political, as much as military or economic, statements, directed at both domestic and foreign audiences. Insofar as the PRC has scored major achievements in space, these reflect positively on both China’s growing power and respect (internationally) and the CCP’s legitimacy (internally). Efforts at inducing Chinese cooperation in space, then, are likely to be viewed in terms of whether they promote one or both objectives. As China has progressed to the point of being the world’s second-largest economy (in gross domestic product terms), it becomes less clear as to why China would necessarily want to cooperate with other countries on anything other than its own terms. Prospects for Cooperation Within this context, then, the prospects for meaningful cooperation with the PRC in the area of space would seem to be extremely limited. China’s past experience of major high-technology cooperative ventures (Sino–Soviet cooperation in the 1950s, U.S.–China cooperation in the 1980s until Tiananmen, and Sino–European space cooperation on the Galileo satellite program) is an unhappy one, at best. The failure of the joint Russian–Chinese Phobos–Grunt mission is likely seen in Beijing as further evidence that a “go-it-alone” approach is preferable. Nor is it clear that, bureaucratically, there is significant interest from key players such as the PLA or the military industrial complex in expanding cooperation.[10] Moreover, as long as China’s economy continues to expand, and the top political leadership values space efforts, there is little prospect of a reduction in space expenditures—making international cooperation far less urgent for the PRC than most other spacefaring states. [FOOTNOTE] [10]It is worth noting here that the Chinese Ministry of Foreign Affairs is not a part of the CCP Politburo, a key power center in China. Thus, the voice of the Ministry of Foreign Affairs is muted, at best, in any internal debate on policy. [END FOOTNOTE] If there is likely to be limited enthusiasm for cooperation in Chinese circles, there should also be skepticism in American ones. China’s space program is arguably one of the most opaque in the world. Even such basic data as China’s annual space expenditures is lacking—with little prospect of Beijing being forthcoming. As important, China’s decision-making processes are little understood, especially in the context of space. Seven years after the Chinese anti-satellite (ASAT) test, exactly which organizations were party to that decision, and why it was undertaken, remains unclear. Consequently, any effort at cooperation would raise questions about the identity of the partners and ultimate beneficiaries—with a real likelihood that the PLA would be one of them.

#### An unhinged PLA triggers Himalayan war – goes global

Chellaney 17 [Dr. Brahma Chellaney, Professor of Strategic Studies at the Center for Policy Research and Fellow at the Robert Bosch Academy, PhD in International Studies from Jawaharlal Nehru University, “Why the Chinese Military’s Rising Clout Troubles Xi Jinping”, The National, 9/9/2017, https://www.thenational.ae/opinion/why-the-chinese-military-s-rising-clout-troubles-xi-jinping-1.626815?videoId=5754807360001]

China’s president Xi Jinping has stepped up his domestic political moves in the run-up to the critical 19th national congress of the Chinese Communist Party next month, but he is still struggling to keep the People’s Liberation Army (PLA) in line. China’s political system makes it hard to get a clear picture, yet Mr Xi’s actions underscore the troublesome civil-military relations in the country. Take the recent standoff with India that raised the spectre of a Himalayan war, with China threatening reprisals if New Delhi did not unconditionally withdraw its forces from a small Bhutanese plateau, which Beijing claims is Chinese territory. After 10 weeks, the face-off on the Doklam Plateau ended with both sides pulling back troops and equipment from the site on the same day, signalling that Beijing, not New Delhi, had blinked. The mutual-withdrawal deal was struck just after Mr Xi replaced the chief of the PLA’s joint staff department. This key position, equivalent to the chairman of the US joint chiefs of staff, was created only last year as part of Mr Xi’s military reforms to turn the PLA into a force “able to fight and win wars”. The Doklam pullback suggests that the removed chief, Gen Fang Fenghui, who has since been detained for alleged corruption, was an obstacle to clinching a deal with India. To be sure, this was not the first time that the PLA’s belligerent actions in the Himalayas imposed diplomatic costs on China. A classic case happened when Mr Xi reached India on a state visit in September 2014. He arrived on Indian prime minister Narendra Modi’s birthday with a strange gift for his host, a predawn Chinese military encroachment deep into India’s northern region of Ladakh. The encroachment, the worst in many years in terms of the number of intruding troops, overshadowed Mr Xi’s visit. It appeared bizarre that the military of an important power would seek to mar the visit of its own head of state to a key neighbouring country. Yet Chinese premier Li Keqiang’s earlier visit to New Delhi in 2013 was similarly preceded by a PLA incursion into another part of Ladakh that lasted three weeks. Such provocations might suggest that they are intentional, with the Chinese government in the know, thus reflecting a preference for blending soft and hard tactics. But it is also possible that these actions underscore the continuing “disconnect between the military and the civilian leadership” in China that then US defence secretary Robert Gates warned about in 2011. During his 2014 India trip, Mr Xi appeared embarrassed by the accompanying PLA encroachment and assured Mr Modi that he would sort it out upon his return. Soon after he returned, the Chinese defence ministry quoted Mr Xi as telling a closed-door meeting with PLA commanders that “all PLA forces should follow the president’s instructions” and that the military must display “absolute loyalty and firm faith in the party”. Recently Xi conveyed that same message yet again when he addressed a parade marking the 90th anniversary of the PLA’s creation on August 1, 1927. Donning military fatigues, Mr Xi exhorted members of his 2.3-million-strong armed forces to “unswervingly follow the absolute leadership of the party.” Had civilian control of the PLA been working well, would Mr Xi repeatedly be demanding “absolute loyalty” from the military or asking it to “follow his instructions”? China does not have a national army; rather the party has an army. So the PLA has traditionally sworn fealty to the party, not the nation. Under Mr Xi’s two immediate predecessors, Hu Jintao and Jiang Zemin, the PLA gradually became stronger at the expense of the party. The military’s rising clout has troubled Mr Xi because it hampers his larger ambition. As part of his effort to reassert party control over the military, Mr Xi has used his anti-corruption campaign to ensnare a number of top PLA officers. He has also cut the size of the ground force and established a new command-and-control structure. But just as a dog’s tail cannot be straightened, asserting full civil control over a politically ascendant PLA is proving unachievable. After all, the party depends on the PLA to ensure domestic order and sustain its own political monopoly. The regime’s legitimacy increasingly relies on an appeal to nationalism. But the PLA, with its soaring budgets and expanding role to safeguard China’s overseas interests, sees itself as the ultimate arbiter of nationalism. To make matters worse, Mr Xi has made many enemies at home in his effort to concentrate power in himself, including through corruption purges. It is not known whether the PLA’s upper echelon respects him to the extent to be fully guided by his instructions. In the past decade, the PLA’s increasing clout has led China to stake out a more muscular role. This includes resurrecting territorial and maritime disputes, asserting new sovereignty claims, and using construction activity to change the status quo. China’s cut-throat internal politics and troubled civil-military relations clearly have a bearing on its external policy. The risks of China’s rise as a praetorian state are real and carry major implications for international security.

#### Extinction.

Caldicott 17 – Helen, 2017, Founder of Physicians for Social Responsibility [“The new nuclear danger: George W. Bush's military-industrial complex,” The New Press]//Elmer

The use of Pakistani nuclear weapons could trigger a chain reac­tion. **Nuclear-armed India, an ancient enemy, could respond** in kind. China, India's hated foe, could react if India used her nuclear weapons, triggering a nuclear [war] ~~holocaust~~ on the subcontinent. If any of either **Russia** or **America**'s 2,250 strategic weapons on hair-trigger alert were launched either **accidentally** or **purposefully** in response, **nuclear winter** would ensue, meaning the **end of most life on earth**.

## collaboration cp

#### CP text: we advocate for public-private partnerships in space in line with the ISS model or a sponsored program model

**ISS National Lab** [International Space Station National Laboratory – Center for the Advancement of Science in Space, “Research on the ISS, No Date, <https://www.issnationallab.org/research-on-the-iss/public-private-partnerships-in-space/>] //neth

Public-private partnerships are a key component to driving innovation and national leadership. With the potential to address a wide array of modern challenges from technology development to infrastructure modernization, and from education to the economic development of space, public-private partnerships unlock new possibilities unavailable when we rely solely on public or private investment. The International Space Station (ISS) National laboratory is a great example of a public-private partnership model that is working in space. The ISS National Lab opens up the incredible possibilities of the space station research environment to a diverse range of researchers, entrepreneurs, and innovators that could create entirely new markets in space. The ISS National Laboratory – Accelerating Utilization of the ISS The ISS offers a unique research and development platform, unlike any on Earth, enabling research that benefits both exploration and life on Earth. In an effort to expand the research opportunities this unparalleled platform provides to the nation, the ISS United States Orbital Segment, through bipartisan legislation, was designated as a U.S. National Laboratory in 2005, enabling research and development access to a broad range of commercial, academic, and government users. After final assembly of the ISS in 2011, the Center for the Advancement of Science in Space, a (501)(c)(3) organization, was selected by NASA to manage the ISS U.S. National Laboratory. The ISS National Lab fulfills its mission to accelerate space-based research by engaging a variety of nontraditional space users, operating in the fields of life science, physical science, technology development, and remote sensing. The ISS National Lab engages primarily with organizations that pay toward the value obtained on the ISS, as well as with other organizations addressing national science and research priorities. This research serves commercial and entrepreneurial needs and other important goals such as the pursuit of new knowledge and education. Since 2011, the ISS National Lab has stewarded more than 200 ISS research projects, ranging from developing new drug therapies, to monitoring tropical cyclones, to improving equipment for first-responders, to producing unique fiber-optics materials in space. Working together with NASA, the ISS National Lab aims to advance the nation’s leadership in commercial space, pursue groundbreaking science not possible on Earth, and leverage the space station to inspire the next generation. Prior to the ISS National Lab model, NASA traditionally funded all aspects of ISS research, whether it was research needed to further exploration, or discovery-based space research that expanded upon its scientific agenda. As the ISS evolved into a National Laboratory, the ISS National Lab has increased the diversity of users by accelerating utilization of the ISS as an innovation platform for a wide variety of partners. These include Fortune 500 organizations, small businesses, educational institutions, philanthropic and research foundations, federal and state government agencies, and other thought leaders in pursuit of groundbreaking technology and innovation who are interested in leveraging microgravity to solve complex research problems on Earth. The ISS National Lab plays a role in not only attracting a diverse set of users, including private companies, to utilize the ISS, but also in engaging the private sector through various research and cost-sharing arrangements. Sponsored Programs – Accelerating Third-Party Funding for Space Research The ISS National Lab has developed a successful Sponsored Program model that attracts third-party funding from private industry and other government agencies to solve big problems or address target challenges. These programs translate into projects on the ISS National Lab. The Sponsored Program model enables an organization to ask new questions and explore key variables, using the ISS National Lab environment as a tool in their innovation portfolio. In return, the organization creates opportunities for targeted research and development projects and STEM education projects or fosters novel ideas of startup companies. Fortune 500 companies, government agencies, and regional incubators have successfully used the ISS National Lab Sponsored Program model. This unique research and development model is flexible to meet the needs and budget of a partnering organization. Successful Sponsored Programs include Boeing Mass Challenge, Massachusetts Life Sciences Center, National Science Foundation (NSF) fluid dynamics and combustion Sponsored Program, and the National Institutes of Health (NIH) National Center for Advancing Translational Sciences (NCATS) organ-on-chip technologies Sponsored Program, totaling more than $20 million in third-party funding over the last two years. Additional Sponsored Programs totaling close to $5 million in 2017 with Fortune 500 organizations are imminent and will target major challenges to humankind as well as STEM education initiatives.

#### Creates competitive markets and has the net benefit of increasing the amount of research we can do

**ISS National Lab** [International Space Station National Laboratory – Center for the Advancement of Science in Space, “Research on the ISS, No Date, <https://www.issnationallab.org/research-on-the-iss/public-private-partnerships-in-space/>] //neth

Commercial Services Providers – A Competitive Marketplace for Space Services As the demand for space research and development projects increases, the supply of access to space and research and development facilities will need to be augmented. In space, private-sector commercial research and development facility operators are on the forefront of a new era of space research on the ISS and future space platforms. These organizations operate their facilities internally and externally on the ISS. They provide users with more choices to address unique research needs and are the pathfinders for a marketplace in low Earth orbit. Many of these companies have used their own resources to invest in in-orbit research and development facilities, reducing the risk for the federal sector to develop these facilities and services. In its first five years, the ISS National Lab has supported growth in the number of these research and development facility operators from one in FY12 to five in FY16—with four additional facilities expected to begin in-orbit operations by FY18. The ISS National Lab fosters healthy competition between these supply partners by allowing them to bid on each commercial customer project, seeking the best solution for the customer. The current commercial facility operators are: NanoRacks – Since 2009, NanoRacks has provided hardware and services for the International Space Station National Laboratory. Three internal research platforms can house plug-and-play NanoLabs and provide critical capabilities such as centrifugation and microscopy. Additionally, the NanoRacks External Platform was launched in FY15 and provides capabilities for Earth and deep space observation, sensor development, and testing for advanced electronics and materials. BioServe – In-orbit offerings from BioServe include multiple life sciences facilities and kits, including the multi-purpose Space Automated Bioproduct Laboratory (SABL), launched in FY15. SABL supports myriad initiatives for commercial life sciences research as well as physical and material science experiments. TechShot – Launched in FY15, the TechShot Bone Densitometer is a commercial bone-density scanner for use in spaceflight rodent research. In just one year, the successful operation of this facility has already demonstrated its utility as a catalyst for disease modeling research and commercial biomedical initiatives in space. Made In Space – In FY16, the Additive Manufacturing Facility developed by Made In Space launched to the International Space Station, enabling 3D printing projects from commercial, educational, and government entities interested in the development of objects for experiments and technology demonstrations. These objects will be produced onboard the International Space Station in a fraction of the time currently required to have such objects manifested and delivered to the station using traditional ground preparation and launch. Space Tango – TangoLab-1 is a general research platform launched in FY16. This facility from Space Tango allows multiple automated experiments in the life and physical sciences to run simultaneously. This architecture minimizes crew member interaction and reduces complexity while increasing scalability, enabling improved throughput for users. In addition to currently available capabilities, a growing pipeline of commercial ISS National Lab facilities in preparation (from Teledyne Brown, AlphaSpace, STaArS, and HNu Photonics) will advance research in remote sensing, materials testing, molecular biology, and tissue culture. Companies are exploring how these capabilities might transition onto future low Earth orbit platforms, from free-flying spacecraft to expandable modules. Through support of such companies, the ISS National Lab and NASA are enabling the International Space Station National Laboratory to serve as an incubator for the low Earth orbit market and U.S. private sector spaceflight interests, and are using public-private partnership funding models to share the risk and benefits of these emerging human space flight activities.

#### No perms

#### 1—the cp is about expanding private appropriation of outer space—so any perm is severance from the aff

#### 2—perms increase neg burden by reducing the neg’s possible offense—results in unnegatability

## Case

### Adv 1

#### US-China war unlikely—both countries want to prevent escalation

**Health & Thompson 17** ([Timothy R. Heath](https://www.rand.org/about/people/h/heath_timothy_r.html) and William R. Thompson, Health has a Ph.D. in political science form  George Mason University a M.A. in Asian Studies from George Washington University and a B.A. in philosophy from College of William and Mary, May 1st, 2017, U.S.-China Tensions Are Unlikely to Lead to War, <https://www.rand.org/blog/2017/05/us-china-tensions-are-unlikely-to-lead-to-war.html>) SJ

By contrast, the U.S.-China relationship today operates at a much lower level of hostility and threat. China and the United States may be experiencing an increase in tensions, but the two countries remain far from the bitter, acrimonious rivalry that defined the U.S.-Soviet relationship in the early 1960s. Neither Washington nor Beijing regards the other as its principal enemy. Today's rivals may view each other warily as competitors and threats on some issues, but they also view each other as important trade partners and partners on some shared concerns, such as North Korea, as [the recent summit](http://www.bbc.com/news/world-us-canada-39517569) between President Donald Trump and Chinese president Xi Jinping illustrated. The behavior of their respective militaries underscores the relatively restrained rivalry. The military competition between China and the United States may be growing, but it operates at a far lower level of intensity than the relentless arms racing that typified the U.S.-Soviet standoff. And unlike their Cold War counterparts, U.S. and Chinese militaries are not postured to fight each other in major wars. Moreover, polls show that the people of the two countries regard each other with [mixed views](http://www.pewresearch.org/fact-tank/2016/03/30/6-facts-about-how-americans-and-chinese-see-each-other/)—a considerable contrast from the hostile sentiment expressed by the U.S. and Soviet publics for each other. Lacking both preparations for major war and a constituency for conflict, leaders and bureaucracies in both countries have less incentive to misjudge crisis situations in favor of unwarranted escalation. To the contrary, political leaders and bureaucracies currently face a strong incentive to find ways of defusing crises in a manner that avoids unwanted escalation. This inclination manifested itself in [the EP-3 airplane collision off Hainan Island](https://theintercept.com/2017/04/10/snowden-documents-reveal-scope-of-secrets-exposed-to-china-in-2001-spy-plane-incident/) in 2001, and in subsequent incidents involving U.S. and Chinese ships and aircraft, such as the harassment of the USNS Impeccable in 2009. This does not mean that there is no risk, however. Indeed, the potential for a dangerous militarized crisis may be growing. Moreover, key political and geostrategic developments could shift the incentives for leaders in favor of more escalatory options in a crisis and thereby make Allison's scenarios more plausible. Past precedents offer some insight into the types of developments that would most likely propel the U.S.-China relationship into a hostile, competitive one featuring an elevated risk of conflict....

#### Private ownership rights are key to effective space development that sustains multinational coalitions

Brooks 20 (Brooks, Andrew. “The Artemis Accords: The Necessary Incentive Of Space Extraction Rights.” Columbia Journal of Transnational Law. November 09, 2020. Web. December 11, 2021. <https://www.jtl.columbia.edu/bulletin-blog/the-artemis-accords-the-necessary-incentive-of-space-extraction-rights>.) SJ

The history of innovation is replete with government incentives for private development. Some incentives took the form of cash prizes, similar to the above-mentioned programs operated by the U.S. government. For example, the British famously offered a cash prize to the first person who would develop a method for determining the longitude of ships at sea, and Napoleon offered a prize for food preservation which led to the invention of canning. The other type of incentive, which the Artemis Accords recognize and create in the space field for the first time, is ownership rights. As Alan Wasser—one of the foremost theorists of space property rights— phrases it: the “right to claim newly settled property has always provided the economic incentive for human expansion.” This held true historically during the Age of Discovery, when joint-stock chartered companies raised massive amounts of capital, funding European exploration and settlement. It also holds true in the modern age, with the patent and copyright systems protecting the owner’s ability to profit from their investment. There is no reason then to assume that ownership rights will provide any lesser incentive for future space development. Despite what critics claim, ownership rights are not a proxy for “national dominance.” Such rights do not displace “multilateral international cooperation.” To the contrary, the emergence of private ownership in space will invariably benefit the sort of multinational coalitions best able to fund the enormous amounts of investment needed to reap any benefit. It is true that there will invariably be competition between private enterprises and partnerships; this is unavoidable given the economic stakes. But this competition is unlikely to be violent. The nation-state signatories of the Accords not only agreed to remain compliant with past agreements and their prohibitions on the militarization of space, but further agreed to “make the scientific results obtained from cooperative activities under these Accords available to the public and the international scientific community.” The Artemis Accords recognize the economic benefits that will flow from space exploration and development. However, unlike the ill-fated 1979 Moon Treaty, they also harness human nature and the incentives that history has shown lead to results. Through recognizing the existence of property rights in space, the Accords provide the framework to protect investment in the space field and give investors the hope that perhaps they themselves will be the world’s first trillionaires.

### Adv 2

#### Space based mining is not likely to be cost effective due to costs involved in the process

Dorminev 21 (Dorminev, Bruce. “Does Commercial Asteroid Mining Still Have A Future?.” Forbes. August 31, 2021. Web. December 13, 2021. <https://www.forbes.com/sites/brucedorminey/2021/08/31/does-commercial-asteroid-mining-still-have-a-future/?sh=17c18fef1a93>.) SJ

Kargel says note only will asteroid mining require additional new advances in both spacecraft technology and launch capability, it will need someone with deep pockets to fund serious space-mining development in a way that enables them to absorb losses of billions of dollars year after year until the technology and mining operations can be scaled up to be profitable. Then unless the metals mined from the asteroids are only used for offworld construction and resources, there’s a potential problem with the economics of importing innumerable quantities of PGMs back to Earth. Paradoxically, what was extraordinarily precious may become extraordinarily cheap. While that may lead to new ingenious and more economical uses of PGMs on earth, it would probably make a space-mining operation’s balance sheet insolvent. Paradoxically, what was extraordinarily precious may become extraordinarily cheap. While that may lead to new ingenious and more economical uses of PGMs on earth, it would probably make a space-mining operation’s balance sheet insolvent. If the PGM price per troy ounce is driven down on earth due to this new cornucopia of asteroid metals, says Kargel, prices for space metals would be driven down to such an extent that launch and space operational costs would again make space-mining untenable. “That to me is a conundrum,” said Kargel.

#### Asteroid mining solves emissions from terrestrial platinum mining---independently solves warming.

MIT Review 18 Emerging Technology [Our mission is to bring about better-informed and more conscious decisions about technology through authoritative, influential, and trustworthy journalism.], 10-19-2018, "Asteroid mining might actually be better for the environment," MIT Technology Review, <https://www.technologyreview.com/2018/10/19/139664/asteroid-mining-might-actually-be-better-for-the-environment/> // ella

For a certain kind of investor, asteroid mining is a path to untold riches. Astronomers have long known that asteroids are rich in otherwise scarce resources such as platinum and water. So an obvious idea is to mine this stuff and return it to Earth—or, in the case of water, to a moon base or Earth-orbiting space station. There is no shortage of interest in these ventures. In the last decade, investors have funded half a dozen companies that have set their sights on various nearby rocks. To many observers, it’s only a matter of time before such a mission gets the green light. But profit margins are only part of the picture. A potentially more significant aspect of these missions is the impact they will have on Earth’s environment. But nobody has assessed this environmental impact in detail. Today, that changes thanks to the work of Andreas Hein and colleagues at the University of Paris-Saclay in France. These guys have calculated the greenhouse-gas emissions from asteroid-mining operations and compared them with the emissions from similar Earth-based activities. Their results provide some eyebrow-raising insights into the benefits that asteroid mining might provide. The calculations are relatively straightforward. Rocket launches release significant amounts of greenhouse gases into the atmosphere. The fuel on board the first stage of a rocket burns in Earth’s atmosphere to form carbon dioxide. For kerosene-burning rockets, one kilogram of fuel creates three kilograms of CO2. (The second and third stages operate outside the Earth’s atmosphere and so can be ignored.) Reentries are just as damaging. That’s because a significant mass of a re-entering vehicle ablates in the upper atmosphere, producing NOx such as nitrous oxide (N2O), a greenhouse gas that is about 300 times more potent than CO2. By one estimate, the space shuttle released about 20% of its mass in the form of N2O every time it returned to Earth. Hein and co use these numbers to calculate that a kilogram of platinum mined from an asteroid would release some 150 kilograms of CO2 into Earth’s atmosphere. However, economies of scale from large asteroid-mining operations could lower this to about 60 kilograms of CO2 per kilogram of platinum. That needs to be compared with the emission from Earth-based mining. Here, platinum mining generates significant greenhouse gases, mostly from the energy it takes to remove this stuff from the ground. Indeed, the numbers are huge. The mining industry estimates that producing one kilogram of platinum on Earth releases around 40,000 kilograms of carbon dioxide. “The global warming effect of Earth-based mining is several orders of magnitude larger,” say Hein and co. The figures for water are also encouraging. In this case, the authors calculate the greenhouse-gas emissions from an asteroid-mining operation that returns water to anywhere within the moon’s orbit, a so-called cis-lunar orbit. They compare this to the emissions from sending the same volume of water from Earth into orbit. The big difference is that a water-carrying vehicle from Earth can haul only a small percentage of its mass as water. But an asteroid-mining spacecraft can transport a significant multiple of its mass as water to cis-lunar orbit. “Substantial savings in greenhouse gas emissions can be achieved,” say Hein and co.

#### Other policy actions solve climate – space isn’t key

**CSS 2021** (Center for Sustainable Systems, University of Michigan. 2021. "Climate Change: Policy and Mitigation Factsheet." CSS05-20. <https://css.umich.edu/factsheets/climate-change-policy-and-mitigation-factsheet>) //neth

Climate change is a global problem that requires global cooperation to address. The objective of the United Nations Framework Convention on Climate Change (UNFCCC), which virtually all nations, including the U.S., have ratified, is to stabilize greenhouse gas (GHG) concentrations at a level that will not cause “dangerous anthropogenic (human-induced) interference with the climate system.”1 Due to the persistence of some GHGs in the atmosphere, significant emissions reductions must be achieved in coming decades to meet the UNFCCC objective. In 2018, the Intergovernmental Panel on Climate Change (IPCC) published the Special Report on Global Warming of 1.5oC. The report details the impacts of a 1.5oC temperature rise and proposes mitigation strategies to remain below the 1.5oC target. It will require lowering global carbon dioxide (CO2) emissions in 2030 by 45% compared to 2010 and will require net zero emissions around 2050. Current national targets under the Paris Agreement would lead to 52–58 gigatons (Gt) CO2-equivalents (CO2e) per year by 2030 -- not enough to meet the 1.5oC target. 2018 GHG emissions were approximately 42 GtCO2 and would need to drop to between 25-30 GtCO2 per year by 2030 to remain on target.2 In 2019, U.S. GHG emissions were 6.6 GtCO2e.3 CARBON EMISSION PATHWAYS TO ACHIEVE 1.5OC TARGET2 Carbon Emission Pathways To Achieve 1.5C Target GENERAL POLICIES MARKET-BASED INSTRUMENTS Market-based approaches include carbon taxes, subsidies, and cap-and-trade programs.4 In a tradable carbon permit system, permits equal to an allowed level of emissions are distributed or auctioned. Parties with emissions below their allowance are able to sell their excess permits to other parties that have exceeded their emissions allowance.4 Market-based instruments are recognized for their potential to reduce emissions by allowing for flexibility and ingenuity in the private sector.4 REGULATORY INSTRUMENTS Regulatory approaches include non-tradable permits, technology and emissions standards, product bans, and government investment. In 2007, the U.S. Supreme Court ruled that CO2 and other GHG emissions meet the Clean Air Act’s defition of air pollutants, which are regulated by the U.S. Environmental Protection Agency (EPA).5 After several appeals, the U.S. Court of Appeals upheld the ruling in 2012.6 In the U.S., the Safer Affordable Fuel-Efficient (SAFE) vehicles rule, administered by NHTSA, was implemented in 2020.7 In comparison to the 2012 Corporate Average Fuel Economy (CAFE) standards, the SAFE rule is less demanding than CAFE and will result in 867-923 million metric tons more CO2 emissions compared to CAFE standards.7,8 In 2021, NHTSA assessed the Safe I Rule and has proposed repealing the rule in favor of establishing regulations that align with the Energy Policy and Conservation Act (EPCA).9 VOLUNTARY AGREEMENTS Voluntary agreements are generally made between a government agency and one or more private parties to “achieve environmental objectives or to improve environmental performance beyond compliance.”10 EPA partners with the public and private sectors to oversee a variety of voluntary programs aimed at reducing GHG emissions, increasing clean energy adoption, and adapting to climate change.11 THE KYOTO PROTOCOL The Kyoto Protocol came into force on February 16, 2005, and established mandatory, enforceable targets for GHG emissions. Initial emissions reductions for participating countries ranged from –8% to +10% of 1990 levels, while the overall reduction goal was 5% below the 1990 level by 2012. When the first commitment period ended in 2012, the Protocol was amended for a second commitment period; the new overall reduction goal is 18% below 1990 levels by 2020.12 THE PARIS AGREEMENT In December of 2015, all Parties of the UNFCCC reached a climate change mitigation and adaptation agreement, called The Paris Agreement, in order to keep the global temperature increase (from pre-industrial levels) below a 2oC.13 The Paris Agreement entered into force on November 4, 2016. As of July 2021, The Paris Agreement had 197 signatories, of which 191 parties (accounting for at least 55% of total global emissions) have ratified the agreement.14 GOVERNMENT ACTION IN THE U.S. FEDERAL POLICY According to the U.S. Senate, “…Congress should enact a comprehensive and effective national program of mandatory, market-based limits and incentives on emissions of greenhouse gases that slow, stop, and reverse the growth of such emissions at a rate and in a manner that will not significantly harm the United States economy and will encourage comparable action by other nations…”15 Due to the Consolidated Appropriations Act of 2008, large emitters of GHGs in the U.S. must report emissions to the EPA.16 In 2015, the proposed Clean Power Plan set a national limit for CO2 emissions from power plants. In early 2016, the plan was stayed by the Supreme Court.17 In 2019, the EPA repealed the Clean Power Plan and replaced it with the Affordable Clean Energy (ACE) Rule.17 By January 2021, the U.S. Court of Appeals vacated the ACE Rule and remanded back to the EPA.18 In 2019, a Green New Deal resolution was introduced in the U.S. House. It proposes at 10-year mobilization effort to focus on goals such as net-zero GHG emissions, economic security, infrastructure investment, clean air and water, and promoting justice and equality.19 In April 2021, President Biden held the Leaders Summit on Climate with 40 world leaders and announced the U.S. will “target reducing emissions by 50-52 percent by 2030 compared to 2005 levels.”20 STATE POLICY Climate change action plans have been enacted by 33 states and D.C.21 Twenty four states and D.C. have GHG emission reduction targets. California is targeting GHG emissions 40% below 1990 levels by 2030 and net zero CO2 emissions by 2045.22 Thirty states, D.C., and 3 U.S. territories have Renewable Portfolio Standards, which specify the percentage of electricity to be generated from renewable sources by a certain date. Five states have Clean Energy Standards, which specify the percentage of electricity to be generated from low-to-no carbon sources and can include renewables, nuclear, and advanced fossil fuel plants with carbon capture and sequestration.23 A group of governors formed the U.S. Climate Alliance, to uphold the GHG reductions outlined in the Paris Agreement. The alliance represents 57% of the U.S. population and 61% of the U.S. economy.24 STATES WITH RENEWABLE AND/OR CLEAN ENERGY STANDARDS23 States with Renewable and/or Clean Energy Standards MITIGATION STRATEGIES Stabilizing atmospheric CO2 concentrations requires changes in energy production and use. Effective mitigation cannot be achieved without individual agencies working collectively towards reduction goals.10 Stabilization wedges are one display of GHG reduction strategies; each wedge represents 1 billion tons of carbon avoided in 2054.25 Energy Savings: Many energy efficiency efforts require an initial capital investment, but the payback period is often only a few years. In 2016, the Minneapolis Clean Energy Partnership planned to retrofit 75% of Minneapolis residences for efficiency and allocated resources to buy down the cost of energy audits and provide no-interest financing for energy efficiency upgrades.26 Fuel Switching: Switching power plants and vehicles to less carbon-intensive fuels can achieve emission reductions quickly. For instance, switching from an average coal plant to a natural gas combined cycle plant can reduce CO2 emissions by approximately 50%.10 Capturing and Storing Emissions: CO2 can be captured from large point sources both pre- and post-combustion of fossil fuels. Once CO2 is separated, it can be stored underground depending on the geology of a site. Currently, CO2 is used in enhanced oil recovery (EOR), but long-term storage technologies remain expensive.27 Alternatively, existing CO2 can be removed from the atmosphere through Negative Emissions Technologies and approaches such as direct air capture and sequestration, bioenergy with carbon capture and sequestration, and land management strategies.28

#### Negative feedback loops check for warming

[Singer](https://www.heartland.org/sites/default/files/12-04-15_why_scientists_disagree.pdf) et al 15. (Dr. Siegfried Fred Singer is an Austrian-born American physicist and emeritus professor of environmental science at the University of Virginia. Dr. Robert Merlin Carter was an English palaeontologist, stratigrapher and marine geologist. Dr. Craig D. Idso is the founder, former president and current chairman of the board of the Center for the Study of Carbon Dioxide and Global Change. Why Scientists Disagree About Global Warming. December 4, 2015. https://www.heartland.org/sites/default/files/12-04-15\_why\_scientists\_disagree.pdf)

A doubling of CO2 from pre-industrial levels (from 280 to 560 ppm) would likely produce a temperature forcing of 3.7 Wm-2 in the lower atmosphere, for about ~1°C of prima facie warming. # IPCC models stress the importance of positive feedback from increasing water vapor and thereby project warming of ~3–6°C, whereas empirical data indicate an order of magnitude less warming of ~0.3–1.0°C. # In ice core samples, changes in temperature precede parallel changes in atmospheric CO2 by several hundred years; also, temperature and CO2 are uncoupled through lengthy portions of the historical and geological records; therefore CO2 cannot be the primary forcing agent for most temperature changes. Atmospheric methane (CH4) levels for the past two decades fall well below the values projected by IPCC in its assessment reports. IPCC’s temperature projections incorporate these inflated CH4 estimates and need downward revision accordingly. # The thawing of permafrost or submarine gas hydrates is not likely to emit dangerous amounts of methane at current rates of warming. # Nitrous oxide (N2O) emissions are expected to fall as CO2 concentrations and temperatures rise, indicating it acts as a negative climate feedback. # Other negative feedbacks on climate sensitivity that are either discounted or underestimated by IPCC include increases in low-level clouds in response to enhanced atmospheric water vapor, increases in ocean emissions of dimethyl sulfide (DMS), and the presence and total cooling effect of both natural and industrial aerosols.

## General

#### Privatization is inevitable – 75% of space is already privatized

**Urrutia 2018** (Doris Elin Urrutia, October 12, 2018, “How Will Private Space Travel Transform NASA's Next 60 Years?” <https://www.space.com/42113-nasa-future-private-spaceflight.html>) //neth

First, people should understand that about 75 percent of the worldwide space enterprise is already commercial, said Scott Hubbard, an adjunct professor in the Department of Aeronautics and Astronautics at Stanford University. This includes the satellites belonging to DirecTV and Sirius XM radio. What's news is the extension of that into the human realm," said Hubbard, who also previously directed NASA's Ames Research Center in Silicon Valley. He served as the agency's "Mars czar," restructuring NASA's robotic Red Planet-exploration program after it suffered several failures in the 1990s. And if private companies can get the price of a suborbital flight down to about $50,000, "you get a lot of interest," Hubbard told Space.com. The highest-profile program currently in the works between NASA and the private sector is the agency's Commercial Crew Program, said Eric Stallmer, president of the nonprofit Commercial Spaceflight Federation. Commercial Crew is encouraging the development of U.S. spacecraft that will carry astronauts to and from the International Space Station (ISS). Toward this end, NASA has awarded multibillion-dollar contracts to both SpaceX and Boeing, which are building capsules called Crew Dragon and CST-100 Starliner, respectively. These craft are currently scheduled to start flying astronauts sometime next year. There's also the maturing commercial cargo program, which has given contracts to SpaceX and Northrop Grumman Corp. to fly robotic cargo missions to the ISS. Both of these companies have already completed numerous such flights. Both Hubbard and Stallmer said that NASA wins by relying on private industry to provide such services in low Earth orbit. Hubbard argued that this strategy allows the space agency to continue "exploring the fringe where there really is no business case."