## 1st is the Putin Backlash DA

#### The plan is perceived as a claim to sovereignty that violates international space law – scares Russia – their evidence.

1AC Fessl 19 – Sophie Fessl, PhD King’s College London, BA Oxford, 7/10/19 [JSTOR Daily, “Should the Moon Landing Site Be a National Historic Landmark?” <https://daily.jstor.org/should-the-moon-landing-site-be-a-national-historic-landmark/>] Justin

But how to preserve and protect human artifacts on the moon? In 1999, the anthropologist Beth O’Leary, with the Lunar Legacy Project, proposed that Tranquility Base become a National Historic Landmark. As a first step, the group of archaeologists, curators, and physicists documented artifacts in Tranquility Base for a preliminary archaeological site plan. However, when O’Leary approached NASA, she was rebuffed: “taking steps to preserve it would be perceived as a U.S. claim of sovereignty over the Moon,” according to Roger Launius, a former NASA chief historian.

All attempts to protect sites on the moon have to grapple with space law. At the height of the Space Race, in 1967, the Outer Space Treaty was drafted, ratified, and came into force. “Both the United States and the Soviet Union feared that the other nation would claim sovereignty over a celestial body such as the moon, place weapons there, and exclude the other from those same privileges by virtue of being first,” Kyle Ellis writes in the Fordham Environmental Law Review. The treaty prohibits states from owning territory on the moon. “Space junk,” however, continues to belong to the state that sent the craft or equipment into space.

This leaves space custodians with a conundrum, writes Capelotti (the anthropologist). “If the U.S. owns the archaeological remains of Apollo 11 but not the ground underneath it, how to protect the former without disturbing the latter? Does America own Neil Armstrong’s famous first footprints on the Moon but not the lunar dust in which they were recorded?”

Artifacts in Orbit

In 2011, NASA issued guidelines for how missions to the moon should avoid crashing into artifacts or spraying rocket exhaust onto historic sites. These guidelines include no-fly zones over the landing sites of Apollo 11 and Apollo 17, and boundaries to how close rovers approach landers.

But these are, for the moment, just recommendations. In 2010, efforts by O’Leary led to the listing of objects and structures at Tranquility Base on the California and New Mexico State Registers of Cultural Properties. In 2013, a bill introduced to the House of Representatives, The Apollo Lunar Landing Legacy Act, proposed to preserve all six Apollo landing sites as National Historical Parks, seeking World Heritage Site status for the Apollo 11 landing area.

But this bill also stood in contradiction with existing space law, and failed. “Although the bill acknowledges treaty obligations of the United States, it would create, in effect, a unilateral U.S. action to control parts of the Moon. …It is legally flawed, unenforceable, and contradictory to our national space policy and our international relations in space,” wrote Henry Hertzfeld and Scott Pace in an article in Science. A new bill, the One Small Step to Protect Human Heritage in Space Act, introduced in the Senate in May, tries a different approach, requiring all U.S.-licensed missions to adhere to NASA’s guidelines from 2011.

#### Putin has banked his prestige off of appropriation of the moon – the plan’s unilateral claim to sovereignty is a shock to dreams of hegemony.

Whittington 20 – Mark, Published a political study of space exploration entitled Why is It So Hard to Go Back to the Moon? as well as The Moon, Mars and Beyond. He blogs at Curmudgeons Corner. He is published in the Wall Street Journal, Forbes, The Hill, USA Today, the LA Times, and the Washington Post, among other venues, 9/6/20 [The Hill, “Russia makes bid to become a space power with Luna-25 mission to the moon,” <https://thehill.com/opinion/technology/515117-russia-makes-bid-to-become-a-space-power-with-luna-25-mission-to-the-moon>] Justin

Scientific American recently reported that Russia is making progress on its long-planned-for Luna-25 moon lander. The slight is set to take place in October 2021.

Luna-25 will be the first Russian lunar lander since the mid-1970s. The lander is a joint project with the European space agency. The mission is planned as the beginning of a Russian attempt to jumpstart its space program by joining the rush to the moon.

The fact that Luna-25 is scheduled to launch in about a year proves that Russian leader Vladimir Putin recognizes one essential truth of the 21st century. The world is divided into countries that explore space and countries that don’t matter. Putin, whose reason for living is to restore Russia as a superpower, means for the country that he rules over with the power of a Czar to matter.

Russia has a couple of problems to overcome if it means to use a return to the moon as part of its bid to claw its way back to power and respect.

First, many other countries are shooting for the moon. China has already landed two Chang’e landers on the lunar surface and is planning a sample return mission for later in 2020. China intends to land humans on the moon and establish a base.

Israel and India have attempted moon landings and, even though they have failed, are going to mount second attempts. Israel’s second attempt is a private venture in partnership with a German company.

A private company in Japan called ispace is planning a moon landing with a probe called Hakuto-R in 2022. Hakuto-R will weigh 750 pounds and will have a payload capacity of 66 pounds.

Russia’s main rival remains, as it was during the cold war space race, the United States. President Donald Trump has started the Artemis Project, a plan to expand American power and influence into deep space, starting with a return to the moon with human astronauts in 2024. NASA is sponsoring private moon landings starting next year under the Commercial Lunar Payload Systems program. Probes built by Intuitive Machines and Astrobotic are scheduled to launch in 2021. Masten Space Systems will launch a probe in 2022. All of the landers will carry NASA and commercial payloads and instruments.

#### That triggers lashout – extinction.

Gressel 16 [Gustav Acting Director and a senior policy fellow with the Wider Europe Programme at the European Council on Foreign Relations' Berlin office, European Council on Foreign Relations, “The dangerous decade: Russia-NATO relations 2014 to 2024”, July 2016, https://www.ecfr.eu/article/commentary\_the\_dangerous\_decade\_russia\_nato\_relations\_2014\_to\_2024]

The domestic logic of confrontation The Russian economy hit a structural crisis in 2011, so the “power swap” between Putin and Dmitry Medvedev was not sufficiently appreciated by the Russian urban middle class, and later, when oil prices plummeted, the regime looked to its foreign policy to distract people from the worsening domestic situation. But it would be an oversimplification to consider Russia’s policy of escalation as merely a short-term domestic diversion effort. For over a decade, the Russian leadership has tried to define Russia both ideologically and politically as the counter model to Europe, putting it in conflict with Europe. The struggle to reshape the European order will not lessen in the next decade. Structural factors play a role in Russia’s foreign policy. The Russian state is more de-institutionalised and personalised than ever before. The president and a small closed circle of advisers make decisions – sometimes behind closed doors – on crucial foreign policy issues, such as the interventions in Crimea, Donbas, and Syria. Formal government structures and institutions are increasingly irrelevant, while informal ties to the president are pivotal. This system depends solely on the president as post, and to a very large extent on Putin as a person. Any change to the position of the president – such as may come in the 2018 and 2024 elections – will lead to extreme danger for the regime. A highly de-institutionalised system depending on one person will by nature be less effective and more prone to erratic behaviour over time, as the leader ages. The longer this personalised authoritarianism lasts, the less flexible, open, and creative the system will become. It would not be surprising, therefore, if the system collapsed or came close to collapse. In that situation, those holding power might see an escalation to unite the country as a lesser evil. The risk of a succession crisis is amplified by the fact that Putin cannot give up power easily. Putin has a great deal to cover up: he has waged a war in the Donbas outside his constitutional competences, which has caused the deaths of 220 to 2,000 regular Russian servicemen so far, as well as 298 international civilian casualties after Russian air-defence crews shot down Malaysia Airlines flight MH17. Putin cannot be sure of indefinite protection under a new president, nor that any new Russian leadership might not consider extraditing him as part of some political deal. There is no way out save exile in Vienna or Zurich. So, Putin needs to create conditions to allow him to rule beyond 2024. It would be difficult, and very unlikely, to create a protégé who is both unconditionally loyal and no threat, but also capable of managing intra-elite battles. Therefore, Putin has to make elites and society accept that he will lead Russia until his death. The narrative for this move needs to be shaped before 2024, most likely from re-shaping the political order in “Eurasia”. Putin needs a major project that reshapes Russia to allow him stay on, and because of Russia’s political context, the de-institutionalisation of the state, and the concentration of power with a few decision-makers, it will likely need to involve foreign policy rather than domestic modernisation. Thus, the Russian elites’ desire to rewrite the European order will coincide with Putin searching for institutional arrangements to prolong his power. The positioning of different wings of the elite to benefit from the succession could also cause instability. In old age, Putin would pick a successor who shares his thinking about Russia’s future, meaning any potential successor will have to accept the current “Eurasian” ideological framework. Rival security services are key pillars of power, and their loyalty must be secured through policies that appease their interests. All this means that the Kremlin will most likely use its rivalry with the West to stabilise the regime. Russia cannot compete with the West as an economic bloc, so military might and the use of force will be the Kremlin’s main tools to shape its foreign policy and influence its neighbourhood. Contingencies such as domestic insecurity, insurgencies, riots, or terrorist incidents would also be interpreted in an anti-Western context. Russian military endeavours in the post-Soviet space, such as putting down a “Maidan” in Minsk or dealing with jihadist insurgencies in Central Asia, would not threaten NATO directly, but they would increase tensions with the West. Russian security forces usually blame domestic unrest or their own failures on Western interference, and the West is usually critical of Russia’s response to such events. The Kremlin’s paranoia could also trigger escalation, as Russian security forces might seek to pre-emptively destroy “foreign interventionist” forces seen as instigating unrest. The Russian Baltic Navy’s war game of the occupation of Gotland, Aaland, and Bonholm, citing “Scandinavian instigation of public unrest in Moscow”, should show Western policymakers the arbitrariness of Russian accusations. The military balance Militarily, Moscow has repeatedly surprised the West. The West, and particularly Washington, was sure that US military might would deter Russia from acting militarily against the West’s interests. But they failed to recognise the many grey zones where a full US military reaction would not be expected and where Russia could create facts on the ground. Even worse: while Russia could not sustain a war with NATO, especially if the US fully engaged in Europe, Russia could start a war, hoping to deter any major reaction to Russian initial aggression through its nuclear arsenal. The fact that Russia can start a war against NATO, but not sustain it, will remain the prevailing paradigm throughout the “dangerous decade” to come. It means that Russian behaviour inclines towards confrontation, hoping that the West will blink. Such games can easily spiral out of control. Miscalculation, unprofessional behaviour, and inter-agency rivalry for political leadership could cause escalation that Russia could not control. The main cause of Western difficulties in countering an initial Russian military escalation is that European armies in particular need to implement several structural adaptations that will take time to mature. Meanwhile, Russian defence reform is progressing. Russia’s defence reform has been largely successful. Russian armed forces are more combat-ready, flexible, and effective than ever before. The wars in Ukraine and Syria provided a testing ground for new Russian procedures, formations, and equipment. Ukraine in particular, where Russia has rotated battalions from almost every brigade, was an invaluable test. New leadership techniques and increased joint officer training introduced in the early 2010s will have increasing effect as more and more officers go through the new training. Profiting from patriotism and nationalistic hysteria after Crimea, the Russian armed forces could again afford to expand and came closer to fulfilling their recruitment goals than in previous years. On the equipment side, economic troubles derailed the 2011-2020 armament plan, and a decision on the subsequent plan was postponed until 2018. Ukrainian and Western sanctions on the defence sector forced the Russian defence industry to substitute 190 items (from Ukraine) and 860 items (from the West). Russia will not reach its goal of fielding 70 percent new weapons platforms until 2020. But it will upgrade existing weapons platforms, and continue to introduce specialised weapons and combat systems that target weaknesses in Western arsenals. As a result, any Western reaction to a Russian assault would face considerable difficulties, and Russia could at least delay a reaction. The West, and particularly Europe, also has problems producing new weapons systems. Neither Europe nor the US will produce a post-Cold War main battle tank until 2030. For infantry-fighting vehicles and artillery systems, the situation is similar. Additionally, legacy US and European equipment is suffering from wear and tear. Since the end of the Cold War, the West has engaged in expeditionary warfare operations and developed equipment specifically for this kind of mission, most of which is unsuitable for the new context. While the US, Germany, Poland, and Sweden have set out new development and procurement priorities, it will take years or decades to develop new systems. Hence, until 2024, many NATO armies will not be best equipped to engage a Russian enemy. In organisational terms, NATO is trying to react to the readiness and geographic challenge Russia poses. At the Wales Summit, the Alliance set up a small spearhead force to react within days to a hybrid incursion on a limited scale. NATO also began to retrain its forces for Article 5 operations. And the US wants to re-invest in European defence. But as long as NATO relies on “deterrence from a distance”, it will need time to effectively deploy to the eastern frontier or the Black Sea, and deployment will be vulnerable to disruption. Small forces rotating in exposed areas such as the Baltic states are capable of dealing with limited hybrid incursions, but are too small to deter larger invasions. Until NATO places more substantial troops closer to exposed borders, Russia will have a time gap of around a week to range free. But while testing NATO will always be a risky move for Russia, projecting military power into the post-Soviet periphery is not. Georgia, Kazakhstan, Belarus, and Ukraine will remain militarily vulnerable. The West Balkans, where Russia has deep roots in nationalist circles, is a theatre where destabilising action could prepare the ground for another conflict. Any domestic conflict could be used or abused by Russia to create a reason for a pre-emptive military strike to “prevent NATO expansion”. The West has so far neither come up with a credible policy for vulnerable periphery states, nor defined a clear policy for integrating states that have made a democratic transition, nor provided an assistance programme to enable those states to resist a conventional Russian incursion. For the time being, Russia’s expansionism is held back more by its own lack of resources and skills to govern (or finance) larger conquered territories than by neighbouring states’ military capacity. During the Cold War, most neutral states could check a Soviet onslaught, at least enough to allow Western counter-moves, but the existence of many weak and semi-penetrated non-aligned states is a feature of the “dangerous decade”. A succession crisis could easily result in aggression towards that region, and the West should be prepared. Conclusion Russia has ideologically and politically positioned itself as a counter model to Europe, and its leadership claims the right to fight for this model and its recognition in the post-Soviet space and on the world stage. Domestically, the struggle for prestige and international recognition is also a struggle for the current ruling elite’s survival. Putin has created a structure that relies on him as sole permanent political centre and decision maker, and he is dependent on the survival of this system. In the possible succession crises of 2018 and particularly 2024, the regime will fight for the continuation of his power, and confrontation with the West is likely to be used as a unifying force. In the same timeframe, Russia will still enjoy some military advantages over its neighbours, particularly in the post-Soviet space. The situation will remain tense unless the force-structure of the Alliance is greatly altered – and the Russia-NATO founding act revoked. The eastern periphery of the alliance and the Western Balkans will remain especially vulnerable. European-Russian relations are entering a very dangerous decade. Russian domestic instability coincides with a weak neighbourhood, low crisis stability, and military advantages for the party that initiates military operations. The West, and particularly Europe, needs to prepare for these contingencies.

## 2nd is the PLA Backlash DA

#### 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.

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.

#### Preservation of lunar heritage is viewed by China as a claim to sovereignty over the moon and killing Chinese space ambitions

Ji Et Al 1-20 Elliot Ji,, 1-20-2022, "What Does China Think About NASA’s Artemis Accords?," No Publication, https://thediplomat.com/2020/09/what-does-china-think-about-nasas-artemis-accords/SJKS

In May 2020, NASA announced a sweeping new set of principles designed to safeguard the use of outer space titled [the Artemis Accords](https://www.nasa.gov/specials/artemis-accords/index.html). Seeking to ensure transparency and peace in outer space, facilitate international cooperation, and encourage sustainable lunar resource extraction, the Accords “establish a common set of principles to govern the civil exploration and use of outer space.” These principles also include requirements that space activities are interoperable, scientific data is shared, nations commit to providing emergency assistance, and that [historical sites](https://daily.jstor.org/should-the-moon-landing-site-be-a-national-historic-landmark/) are preserved as artifacts. In contrast to the [1967 Outer Space Treaty](https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html) (OST) and the [1979 Moon Agreement](https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/moon-agreement.html), the Artemis Accords are not a new multilateral treaty, but principles that build upon the legal foundations set by the OST. Moreover, NASA intends to enshrine these principles with partner nations through the process of [bilateral cooperation and general state practice](https://www.cfr.org/blog/artemis-accords-and-next-generation-outer-space-governance). In other words, the act of nations accepting these principles through their cooperative ventures with the United States will help [calcify norms into international law](https://spacewatch.global/2020/05/spacewatchgl-feature-the-space-law-context-of-the-artemis-accords-part-2/), even without a legal instrument. However, the purportedly noble goals of the Accords have not evaded skepticism among some spacefaring nations, particularly the People’s Republic of China. Chinese State Media Reacts Although the announcement of the Artemis Accords did not make major headlines in China, the Accords elicited a decisively negative response in Chinese news media. Characterizing the Accords as a disingenuous attempt to stymie Chinese space ambitions, many commentators pointed to the arrival of the announcement shortly after China’s successful test of the Long March 5B, a critical milestone for China’s manned spaceflight programs. Song Zhongping, a Chinese military and aerospace commentator, likened the Accords to the [enclosure movement](https://www.britannica.com/topic/enclosure) in 18th-century Great Britain, during which common land was privatized to the benefit of the wealthy. “The U.S. is developing a new space version of an ‘Enclosure Movement,’ in pursuit of colonization and claiming sovereignty over the moon,” Song [told the Global Times](https://www.globaltimes.cn/content/1187654.shtml), criticizing the “Cold War” mentality of the United States as it sought to outcompete China and Russia in outer space. Chinese central state television [echoed Song’s concerns](https://v.cctv.com/2020/05/07/VIDEKl9vLRJIDOJgL92sVBsW200507.shtml), stating that the Accords are a step toward the enclosure of outer space by a self-interested United States. Others cast doubt on whether the United States could legally justify the Accords under the extant international legal framework. Citing the OST and the Moon Treaty of 1979, critics argued that the Accords violate [key principles of international law, which restrict state sovereignty in outer space](https://www.guancha.cn/internation/2020_05_06_549365.shtml). In articles published by Guancha and the Global Times, observers called the Artemis Accord an unembellished and [“preposterous attempt](https://opinion.huanqiu.com/article/3yBculsgivq?qq-pf-to=pcqq.discussion)” to unilaterally [set ground rules](https://www.guancha.cn/internation/2020_05_06_549365.shtml) for lunar resource exploitation. Zhang Baoxin, a Chinese aerospace expert and chief editor of China Aviation News, also explained that, by excluding Russia and China, the Accords would encourage irresponsible use of lunar resources and instigate conflicts over lunar sovereignty.

**ALL SECTIONSSEARCH**

#### 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**.

## 3rd is the Moon Base Counter Plan

#### CP Text: Private entities ought to cooperate to appropriate the moon by building a moon base with the purpose of scientific studies of Lunar Heritage.

#### That solves 100% of the aff but maintains mutual exclusivity by allowing appropriation of the moon.

#### Private entities are critical to building the moon base – otherwise it’s technologically infeasible.

Stuart 20 – Colin is an Astronomy Author and Speaker. 12/22/20. [Science Focus, “How to build a Moon base,” <https://www.sciencefocus.com/space/how-to-build-a-moon-base/>] Justin

Stage 1: Travelling to the Moon

First things first: the less you take with you the better. It costs at least $10,000 to launch just 1kg of material into space, and that’s before you’ve even got it into lunar orbit and landed it on the Moon. “The big buzzword at the moment is ‘in situ resource utilisation’ or ISRU,” says University of Westminster astrobiologist Prof Lewis Dartnell. In other words, use what’s already there as much as possible to keep the costs down. Therefore, local resources will govern where the base should be located. Woerner’s idea is to start building on the far side of the Moon – the face that always points away from Earth. China also thinks this would be the best location. It would certainly be a good place to install telescopes, but the downside is that you’d need a system of relay satellites to maintain contact with Earth – a key psychological factor as it’s important not to feel too cut off. Plus, if you’re thinking purely in terms of resources, then close to the south pole of the Moon might be a better bet for an initial dwelling as there’s plenty of water ice there as well as other minerals. The Russians are currently looking into the feasibility of a base at Malapert Mountain in this region. The other upside to the south pole is the climate. The Moon is a very different place to the Earth, taking nearly a month to complete one rotation on its axis. So on most parts of the Moon, periods of day and night both last around two weeks. However, some regions of the Moon’s south pole are almost always illuminated, much like the our North Pole in summer. This means there aren’t huge changes in temperature, therefore allowing solar panels to soak up plenty of sunlight with which to power a potential lunar colony. If at first a manned lunar colony seems like too much of a risk, we might start with a robot-only base. That’s certainly the plan that Jaxa, the Japanese Space Agency, has in the pipeline. It hopes to have a permanent robotic enclave on the Moon by 2020, with machines gathering lunar samples up to 97km (60 miles) away before returning to the base and blasting their haul back to Earth via rockets.

Stage 2: Building a Moon base

The advent of 3D printing could be a game-changer. At the end of 2014, the design for a socket wrench was emailed to astronauts on the International Space Station (ISS), who then used their 3D printer to create it. Researchers are excited by the prospect of using a similar technique for bases on the Moon. ESA is already in consultation with architects Foster + Partners about the possibility of creating a large-scale infrastructure on the Moon by 3D printing it using lunar soil as the raw material. “We’ve already demonstrated that 3D printing can be a very efficient tool and that it is possible to process lunar regolith [loose material],” says Laurent Pambaguian, Materials Technology Engineer at ESA. It remains to be seen how the regolith would be collected in sufficient quantities and delivered to the printer, and Pambaguian warns of the need for an initial robotic mission to ensure the system works in the Moon’s reduced gravitational field. But should it be successful, in an emergency a key piece of equipment could be designed, transmitted to the Moon and printed within hours – much faster than the days it would take to dispatch it by rocket. In the concept by Foster + Partners, material would be 3D printed onto a light, inflatable scaffold. However, Bigelow Aerospace proposes the use of a small standalone inflatable pod and is already cooperating with NASA. Their first inflatable Moon bases will be in place by 2025, they say. The Russian plan to colonise Malapert Mountain is also being led by a private company – Lin Industrial. It believes the technology required for such a feat isn’t available now, but predicts it will be in as little as five years. A total of 50 rocket launches would make the base a reality, but at a cost of nearly $10bn.

Stage 3: Living on the Moon When it comes to our fragile frames, the Moon presents a number of biological problems. Humans evolved to live on Earth, not a barren lump of rock over 380,000km (240,000 miles) away. We’d need to test out the effects of altered gravity on our biology too. “Zero gravity is totally devastating to the human body in terms of muscle wastage and the demineralisation of the skeleton,” says Dartnell. On the Moon, the gravity is only one-sixth of what we’re used to. “We don’t know if that’s strong enough for the human body to remain healthy,” he adds. Another key challenge colonisers will face is radiation. The Earth has an atmosphere and a magnetic field, both of which act as giant safety blankets protecting us from solar particles and cosmic rays from the Galaxy at large. With no natural protection from these dangers on the Moon, we’ll have to find a way to shield ourselves. Otherwise radiation will penetrate the astronauts’ skin and dump its energy into their DNA, leading to radiation sickness, cataracts and a much higher risk of cancer. The radiation shield would need to be a couple of metres thick. “You’ll need some form of lunar JCB, which you’d use to bury your habitat in material from the lunar regolith,” says Dartnell, sticking to the ISRU mantra. That’s enough to soak up the radiation before it reaches those living inside. The other essentials are water, oxygen and food. Luckily, the water ice present on parts of the Moon can supply the first two through melting the ice and splitting the H2O up to get at the oxygen. Food will likely come from indoor greenhouses growing fresh fruit and vegetables, something Dartnell believes will have importance beyond simple sustenance. “With Antarctica, even really simple things like growing tomatoes have been shown to be enormously beneficial for keeping people sane,” he says. That psychological angle shouldn’t be forgotten. The first inhabitants of a lunar colony are likely to be very small in number – the Russians, for example, plan to start with two people before boosting it to four. Working in a pressurised, cramped and alien environment takes its toll on the psyche. Lessons can be learnt from previous experiments, like the trips to the ISS and the Mars500 project, in which volunteers were locked away in isolation to recreate a potential trip to the Red Planet.

What we can learn The scientific attraction is clear. The lunar samples returned to Earth by the Apollo astronauts have been an invaluable resource in understanding the inner workings and history of our celestial companion. Yet that knowledge is still limited, as only a small amount of material was returned from a few lunar locations. A team of permanent dwellers would send our ability to study the Moon into overdrive. “A good comparison is how a permanent human infrastructure in Antarctica has facilitated scientific research that wouldn’t have happened if we just parachuted in automatic payloads from time-to-time,” explains Prof Ian Crawford, a planetary scientist from Birkbeck, the University of London. Interestingly, lunar habitation could extend our knowledge of areas far beyond the Solar System – the Moon has long been regarded as an excellent place to build telescopes to peer out into the distant cosmos. Optical telescopes would have an unprecedented view of the centre of our Milky Way and radio telescopes would be free from the ever-increasing background hum of modern civilisation. Humans could be sent to build and service this suite of instruments, much as they do with the mountain-top telescopes on Earth. With so many untapped resources, the first Moon base may not be funded by government-led space agencies at all – private enterprise could be first to set up shop. A recent NASA study suggested that a public-private partnership could slash the cost of the mission by 90 per cent. With eyes also on a permanent Mars colony, the Moon would be an excellent place to test out nascent technologies. It’s certainly a lot safer – if things go wrong it only takes a few days to head for Earth’s safety. Alternatively, emergency supplies could be couriered quickly to the lunar surface. An outpost on Mars would be far more remote, leaving anyone in a colony there at least six months from help.

## Case

### 1NC – Top-level

#### Public sector thumps and so does contracting.

1AC Sample 19 – Ian, Science Editor, PhD at Queens Mary College, 7/19/19 [The Guardian, “Apollo 11 site should be granted heritage status, says space agency boss” <https://www.theguardian.com/science/2019/jul/19/apollo-11-site-heritage-status-space-agency-moon>] Justin

Far more is on the cards. Major space agencies, including ESA and Nasa, plan a “lunar gateway”, described by Wörner as a “bus stop to the moon and beyond”. His vision is for a “moon village”, but rather than a sprawl of domes, shops and a cosy pub, it is more an agreement between nations and industry to cooperate on lunar projects.

The private sector is eager to be involved. Between now and 2024, at least five companies aim to launch lunar landers. In May, Nasa selected three companies to design, build and operate spacecraft that will ferry scientific experiments and technology packages to the moon.

#### There’s no way to regulate it – what counts as “lunar heritage” is too ambiguous and no enforcement body.

1AC Sample 19 – Ian, Science Editor, PhD at Queens Mary College, 7/19/19 [The Guardian, “Apollo 11 site should be granted heritage status, says space agency boss” <https://www.theguardian.com/science/2019/jul/19/apollo-11-site-heritage-status-space-agency-moon>] Justin

But protecting lunar heritage may not be straightforward. On Earth, the United Nations Educational, Scientific and Cultural Organisation (Unesco) decides what deserves world heritage status from nominations sent by countries that claim ownership of the sites. Different rules apply in space. The UN’s outer space treaty, a keystone of space law, states that all countries are free to explore and use space, but warns it “is not subject to national appropriation by claim of sovereignty”. In other words, space is for all and owned by none.

Wörner is not put off and sees no need for troublesome regulations. “My hope is that humanity is smart enough not to go back to this type of earthly protection. Just protect it. That’s enough. Just protect it and have everybody agree,” he said. A no-go zone of 50 metres around Tranquility base should do the job, he added.

### 1AC – Advantage

#### DDE is useless for Moon Dust Research and the creator had to switch careers because his reports were inaccurate – their evidence.

1AC Dovey 19 – Ceridwen Dovey “Moondust Could Cloud Our Lunar Ambitions” <https://www.wired.com/story/moondust-nasa-lunar-ambitions/> (PhD Candidate, Anthropology at NYU, B.A. Anthropology and Environmental Science at Harvard, National Book Foundation Nominee, Contributor to Wired and The New Yorker) Elmer Recut Justin

Not long after O'Brien and his family moved to Houston, he got a call from NASA. The agency hoped to hire him as an astronaut instructor, but it also invited him to submit a proposal for a science experiment to go to the moon. He suggested a device that would measure the energy spectra of charged particles as they rained down on the lunar surface. From a field of 90 submissions, his was one of seven that got the green light. NASA told him that, as a matter of policy, the experiment should include a dust cover, basically a sophisticated strip of plastic. No one knew at this stage just how pesky moondust would be, but O'Brien figured that if the agency was going to the trouble of installing dust covers, it should also include a dust detector.

At first, NASA and its private contractors balked. It would be too difficult, they believed, to construct a detectO'Brien, Avril, and their three children moved back to Sydney in 1968, so he made arrangements to have the tapes shipped to him. He can't quite remember now where he was on the morning in late July 1969 when the Apollo 11 Lunar Module alighted on the moon. He thinks he listened to the radio broadcast between interviews with various Australian news outlets. Yet he does remember, vividly, the moment Aldrin said the module was “kicking up some dust” as it came in to land, as well as Armstrong's observation, just before he stepped off the ladder, that the surface was “almost like a powder.” With a spike of excitement, O'Brien realized his DDE might very well prove its worth.

As it turned out, the seismometer abruptly overheated shortly after Apollo 11 left the moon. (Before it ceased working, O'Brien says, it registered the footsteps of the astronauts on the ladder and “the gurgle of the fuel sloshing around.”) But the DDE soldiered on and quickly revealed the mischief that dust could make. Almost as soon as the Lunar Module took off, two of the detector's three solar cells registered a sudden drop in output, one of them by 18 percent. This was accompanied by a spike in temperature. To O'Brien, there was only one logical explanation: The DDE had been blanketed in dust, which, like blackout blinds, kept light out and heat in. It seemed obvious to him that the seismometer had met the same fate.or that was light enough to meet the mission specs and simple enough that it wouldn't take up any of the astronauts' limited time and attention. On the moon, distractions could be deadly. O'Brien thought their resistance was “bloody stupid” and, with the help of that cocktail napkin, came up with a design to allay their concerns. It consisted of three tiny solar cells mounted on a box, which was painted white to reflect sunlight. As dust settled on the cells, their power output would drop, providing a clear record of accumulation over time. O'Brien threw in a few temperature sensors for good measure, bringing the experiment's total weight to a dainty 10 ounces. Because the DDE was so small, it could be bolted onto the seismometer that Aldrin and Neil Armstrong were setting up to measure moonquakes. Upon hearing all this, NASA relented: The DDE could go to the moon. Once there, it would feed its data to the seismometer, whose antenna would transmit the readings back to Earth. They'd be stored on reels of magnetic tape for further analysis.

If NASA hoped to keep its moon-based instruments working on future Apollo missions, O'Brien concluded, it would need to study the matter of dust-spraying thoroughly. That August, he wrote proudly to an Australian colleague that “the DDE may really have earned its trip!” But his American counterparts, particularly the technicians at the Manned Spacecraft Center, were not so enthused. Some of them, he believes, were less interested in the pursuit of scientific knowledge than in the chest-thumping goal of landing Americans on the moon. Ultimately, the seismometer stopped accepting commands from mission control, and the whole experiment—DDE included—was shut down after 21 days.

In October, NASA released its preliminary science report on Apollo 11. It largely rejected O'Brien's explanation for the DDE readings, blaming the solar cells' unexpectedly low output on calibration errors. (This was in a chapter coauthored by O'Brien, yet he says he “strongly disagreed” with the findings and never gave permission for his name to be included.) O'Brien tried to argue his case again in the Journal of Atmospheric Physics, using one of Australia's first supercomputers, SILLIAC, to crunch and plot the data on endless ribbons of paper. But the article landed with a thud and was barely cited by other researchers in the decades that followed.

O'Brien was forced to admit defeat in round one of the moondust wars. He changed careers, becoming the first head of the Environmental Protection Authority of Western Australia. The position was based in Perth, and when Avril made the three-day train trip from Sydney, she brought the kids and the 172 reels of DDE data with her. O'Brien asked a colleague at a local university to put the tapes in storage. And so, for 40-odd years, that's where they stayed.

#### Smith 19 is missing an aff key warrant – stating Moon Research is good isn’t sufficient to access your impact because Smith’s argument is that when astronauts went to the moon, the research that had occurred was key to Moon Basing, not a reason why further research is key.

#### We’ll insert below – this is almost egregious.

1AC Smith 19 Belinda Smith 7-18-2019 “Who protects Apollo sites when no-one owns the Moon?” <https://www.abc.net.au/news/science/2019-07-19/apollo-11-moon-landing-heritage-preservation-outer-space-treaty/11055458> (Strategic Communications Advisor at Department of Education and Training at University of Victoria)//Elmer Recut Justin

It's not just about history Alongside heritage value, the bits and pieces left on the Moon have enormous scientific significance. Take moon dust. It's a real problem for moon-bound equipment because it's made of fine, super sticky and highly abrasive grains, which have a habit of clogging instruments and spacesuits. But as Armstrong and Aldrin trotted across the surface, the footprints they left behind gave us valuable information into the properties of moon dust, Flinders University space archaeologist Alice Gorman said. "The ridges on the boots were meant to measure how far they sank into the dust. "Then they used the light contrast between the ridges to measure the reflectance properties of the dust." A boot print in grey dust. This iconic photo of Buzz Aldrin's footprint is also a science experiment. (Supplied: NASA) It's data like this that will help if we want a long-term base on the Moon — we need to know how our gear will stand up to lunar conditions. Apart from the sticky, gritty dust, the lunar surface is also peppered with meteorites and cosmic rays. So, Dr Gorman said, one of the very few reasons to revisit a moon site is to collect some of the equipment left behind and see how it fared. "What has happened to this material in 50 years of sitting on the lunar surface? "This is going to be really interesting scientific information because it will help planning for future missions and get an understanding of long-term conditions." And NASA has already done this. The Apollo 12 mission, which landed on the Moon four months after Apollo 11, collected parts from the 1967 Surveyor probe and brought them back to Earth. An astronaut standing next to a piece of equipment on the lunar surface Along with rocks and soil samples, Apollo 12 astronauts collected pieces of the Surveyor 3 probe for analysis back on Earth. (Supplied: NASA) Another reason to preserve the equipment left on the Moon is to prove we really went there, Professor Capelotti said. "There's a lot of people out there who still don't believe it happened. "The stuff on the Moon is a testament to what we did and when we did it."

#### There are multiple problems that gut aff solvency- an observatory can’t do anything.

Hamill 16 – Patrick. "Atmospheric observations from the moon: A lunar earth-observatory." 2016 Ieee International Geoscience and Remote Sensing Symposium (Igarss). IEEE, 2016. (Department of Physics and Astronomy at San Jose State University)//Elmer

There are a number of problems associated with placing an observatory on the Moon. We will consider a few of them.

As alluded to above, the surface of the Moon is a harsh environment. During the sunlit period, the temperature ranges from as low as 120 K during the lunar night to nearly 400 K during the day in direct sunlight. It would be beneficial to place the observatory in a deep crater, shielded from the direct rays of the sun and thus maintained at a nearly constant very cold temperature. In the absence of an appropriate cavity, it might be possible to shield the observatory artificially by erecting tall walls around it, so that it would be shaded from the sun except during short intervals.

The lunar surface is covered in electrostatically charged fine dust particles of diameter 70 µm. This dust has sharp edges (not having been exposed to weathering) and is expected to cling to surfaces to which it is exposed. It is believed that the dust is disturbed by the changing electric field at the terminator and rises to heights of several meters [9]. This effect may have been observed by the Apollo astronauts. The dust may damage unshielded equipment [10]. Some investigators have even suggested that the presence of dust would make telescopic observations impossible, but the evidence from Chang’e 3 shows that this is not the case. (It might be mentioned that the Chang’e 3 instrumentation is protected during sunrise and sunset.) Furthermore, the retroreflectors placed on the lunar surface by NASA Astronauts and Soviet robotic rovers over forty years ago still reflect laser beams, indicating that even over long periods of time optical surfaces are not completely degraded by the lunar dust [11].

The difficulties and problems in the construction of a large lunar telescope were considered by Van Susante [12]. These can be alleviated by constructing the entire observatory on Earth and enclosing it in a single package. This is sometime referred to as “suitcase science.”

In considering telescopes on the Moon it is often assumed that they will be placed in the Malapert Mountain region near the South Pole, as the NAC committee deemed the nearby rim of the Shakelton Crater to be the preferred site for a manned lunar outpost [2]. However, at this location the Earth is not visible at all times. The optimal location of the observatory would be in a deep crater near the Earth-facing equatorial region of the Moon.

#### There’s a disconnect between their solvency and the impact – Lunar Bases being able to observe when massive Weather events occur doesn’t mean we are able to stop them – they have to win a solvency warrant that we can actually solve super volcanoes are natural disasters which are literally impossible to solve.

#### Biodiversity loss good – elevated levels of biodiversity destabilizes ecosystems, destroys quality of biomass production, and destroys the climate and ecological health.

**Hays 18** Brooks Hays, 10-18-2018, "Too much biodiversity can be bad for some ecosystems," UPI, <https://www.upi.com/Science_News/2018/10/18/Too-much-biodiversity-can-be-bad-for-some-ecosystems/3801539866906/> SJCP//JG

Oct. 18 (UPI) -- New research suggests it's possible to have too much biodiversity. In lab tests, scientists in Switzerland showed elevated levels of biodiversity can destabilize ecosystems under certain conditions. Understandably, most research into the effects of climate change on ecological health have focused on decreased levels of biodiversity measured around the globe. The evidence on the topic is consistent. Most ecosystems host too little biodiversity, not too much. But researchers at the University of Zurich and the Swiss Federal Institute of Aquatic Science and Technology weren't interested in most ecosystems -- or any real ecosystem, for that matter. They wanted to better understand the relationship between biodiversity and ecological stability. In the lab, the team of ecologists created miniature ecosystem models using different combinations of six ciliates species. Ciliates are tiny protozoans that live anywhere there is water. In sample vials, scientists mixed different numbers and combinations of ciliate species. Researchers then exposed the miniature model ecosystems to temperatures between 15 and 25 degrees Celsius. Different models were exposed to different levels of warming to approximate climate change. A special computer algorithm and video analysis technology allowed scientists to track the different species and changing levels of biomass in each vial. The experiments produced contradictory results. The data showed biodiversity have both a positive and negative impact on ecosystem stability. "Ecological stability is complex and consists of various components," Frank Pennekamp, an evolutionary biologist at the University of Zurich, [said in a news release](https://www.media.uzh.ch/en/Press-Releases/2018/Biodiversity.html). "The experiment shows how biodiversity affects the individual stability components in different ways." Scientists identified a strong correlation between biodiversity and stable biomass production. The greater the number of species in a vial, the less biomass production fluctuated. But as temperatures increased, scientists found biodiversity put a downward pressure on biomass production. Protozoans in diverse and warming ecosystems produced less biomass. The new study -- published this week [in the journal Nature](https://www.nature.com/articles/s41586-018-0627-8) -- suggests biodiversity, under certain circumstances, can in fact limit an ecosystem's stability. "The results make it clear that more species alone is not enough to ensure the overall stability of an ecosystem," said Florian Altermatt, professor of aquatic ecology at the Swiss Federal Institute of Aquatic Science. "In addition to a diversity of species, the species themselves must be able to react to environmental changes in a variety of ways."