# 1NC Berkeley Round 6

## 1

### T

#### Interpretation: “the appropriation of outer space” is a generic indefinite singular. The aff may not defend a subset of appropriation of outer space by private entities being unjust.

#### The definite article “the” makes the rez a definite singular – it’s generic

CCC n.d. [Capital Community College, a nonprofit 501 c-3 organization that supports scholarships, faculty development, and curriculum innovation.] “Articles, Determiners, and Quantifiers.” Capital Community College. <http://grammar.ccc.commnet.edu/grammar/determiners/determiners.htm#articles> TG

The three articles — a, an, the — are a kind of adjective. The is called the definite article because it usually precedes a specific or previously mentioned noun; a and an are called indefinite articles because they are used to refer to something in a less specific manner (an unspecified count noun). These words are also listed among the noun markers or determiners because they are almost invariably followed by a noun (or something else acting as a noun). caution CAUTION! Even after you learn all the principles behind the use of these articles, you will find an abundance of situations where choosing the correct article or choosing whether to use one or not will prove chancy. Icy highways are dangerous. The icy highways are dangerous. And both are correct. The is used with specific nouns. The is required when the noun it refers to represents something that is one of a kind: The moon circles the earth. The is required when the noun it refers to represents something in the abstract: The United States has encouraged the use of the private automobile as opposed to the use of public transit. The is required when the noun it refers to represents something named earlier in the text. (See below..) If you would like help with the distinction between count and non-count nouns, please refer to Count and Non-Count Nouns. We use a before singular count-nouns that begin with consonants (a cow, a barn, a sheep); we use an before singular count-nouns that begin with vowels or vowel-like sounds (an apple, an urban blight, an open door). Words that begin with an h sound often require an a (as in a horse, a history book, a hotel), but if an h-word begins with an actual vowel sound, use an an (as in an hour, an honor). We would say a useful device and a union matter because the u of those words actually sounds like yoo (as opposed, say, to the u of an ugly incident). The same is true of a European and a Euro (because of that consonantal "Yoo" sound). We would say a once-in-a-lifetime experience or a one-time hero because the words once and one begin with a w sound (as if they were spelled wuntz and won). Merriam-Webster's Dictionary says that we can use an before an h- word that begins with an unstressed syllable. Thus, we might say an hisTORical moment, but we would say a HIStory book. Many writers would call that an affectation and prefer that we say a historical, but apparently, this choice is a matter of personal taste. For help on using articles with abbreviations and acronyms (a or an FBI agent?), see the section on Abbreviations. First and subsequent reference: When we first refer to something in written text, we often use an indefinite article to modify it. A newspaper has an obligation to seek out and tell the truth. In a subsequent reference to this newspaper, however, we will use the definite article: There are situations, however, when the newspaper must determine whether the public's safety is jeopardized by knowing the truth. Another example: "I'd like a glass of orange juice, please," John said. "I put the glass of juice on the counter already," Sheila replied. Exception: When a modifier appears between the article and the noun, the subsequent article will continue to be indefinite: "I'd like a big glass of orange juice, please," John said. "I put a big glass of juice on the counter already," Sheila replied. Generic reference: We can refer to something in a generic way by using any of the three articles. We can do the same thing by omitting the article altogether. A beagle makes a great hunting dog and family companion. An airedale is sometimes a rather skittish animal. The golden retriever is a marvelous pet for children. Irish setters are not the highly intelligent animals they used to be. The difference between the generic indefinite pronoun and the normal indefinite pronoun is that the latter refers to any of that class ("I want to buy a beagle, and any old beagle will do.") whereas the former (see beagle sentence) refers to all members of that class.

#### Violation – they only defend Lunar Heritage Sites

#### Vote neg:

#### 1] Limits – they can pick any form of appropriation from internet satellites to asteroid mining to moon basing to Mars colonization and there’s no universal disad since they’re all different and require different uses space – explodes neg prep and leads to random appropriation of the week affs which makes cutting stable neg links impossible. PICs don’t solve – it’s absurd to say neg potential abuse justifies the aff being flat out not T, which leads to a race towards abuse.

#### CI- Reasonability is arbitrary and we don’t know the brightline while prepping.

#### No RVIs- A] Illogical- you don’t win for being fair B] Encourages baiting theory which proliferates abuse

#### 1AR theory is skewed towards the aff – a) the 2NR must cover substance and over-cover theory, since they get the collapse and persuasive spin advantage of the 3min 2AR, b) their responses to my counter interp will be new, which means 1AR theory necessitates intervention. Implications – a) reject 1AR theory since it can’t be a legitimate check for abuse, b) drop the arg to minimize the chance the round is decided unfairly, c) use reasonability with a bar of defense or the aff always wins since the 2AR can line by line the whole 2NR without winning real abuse

## 2

### 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.

## 3

### CP

#### 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.

## 4

### CP

#### Counterplan Text: States ought to place antineutrino detectors, streaming live data to and monitored by the International Atomic Energy Agency, within 10 meters of all nuclear reactors.

#### That solves Neutrinos – the technology already exists, it just needs to be implemented

Scoles 20, Sarah. “Neutrino Detectors Could Be Used to Spot Nuclear Rogues” Wired, Oct 6, 2020, <https://www.wired.com/story/neutrino-detectors-could-be-used-to-spot-nuclear-rogues/> TG

These days, Svoboda and a growing number of colleagues are interested in using signals from neutrinos that burst from reactors for nuclear security: to perhaps detect undeclared devices and to ensure that known reactors are not being used to amass material for weapons. The neutrino signature that slams straight through a reactor’s walls changes with what’s going on inside, providing a window into how much plutonium is in there, and whether it matches what’s expected. If not, it’s a clue that some of it may have been diverted toward weapons programs. It’s a real-time measurement that could augment the inspections and measurements that officials from the International Atomic Energy Agency currently do. Those “safeguards” measures take many forms: first, declarations from facilities about what they’re up to. And second, monitoring. That involves inspections both routine and ad hoc, satellite imagery, open-source analysis, camera surveillance, collection and analysis of sample nuclear material, and environmental analysis. But neutrinos never lie, can’t hide, and tell the truth as it unfolds. The tech isn’t quite ready for prime time, but some scientists think neutrino monitoring might be practical, and they’re taking (small) steps toward making that happen: The Department of Energy recently commissioned a study on nuclear security applications for neutrino detectors, and this summer it spooled up a group that aims to determine where the technology might be useful to policy types. A project with the creepy name Watchman, which Svoboda works on, is also developing detectors and methods that officials could use to pick up neutrino signals from a reactor dozens of miles away, revealing its activities without being right next door.

#### That solves prolif detection and is a sufficient distance – we’ve inserted lines they highlighted in 1AC Lee – it also concedes squo solves cuz the existence of the tech is a deterrent which is a reason to negate on presumption

1AC Lee 20 Thomas Lee "Can tiny, invisible particles help stop the spread of nuclear weapons?" <https://engineering.berkeley.edu/news/2020/03/can-tiny-invisible-particles-help-stop-the-spread-of-nuclear-weapons/> (Associate Adjunct Professor, Research Scientist Operations & IT Management.)//Elmer

* The neutrino detection technology could offer a solution.
* Optimizing reactor power levels to produce plutonium, a telltale sign that a country is trying to build a bomb, will change the rate and energy spectrum of antineutrinos that a device parked outside of the reactor can detect. And since these particles can pass through matter, the operator can’t shield the reactor’s release of antineutrinos the same way lead blocks X-rays.
* For now, a detector must stay within tens of meters of the reactor to be effective.
* And in any case, the mere knowledge that such technology has become a reality could prove to be a powerful deterrent to nuclear proliferation in itself.

## 5

### CP

#### CP Text: States ought to call a global constitutional convention and establish a constitution reflecting intergenerational concern with exclusive authority to ban appropriation of lunar heritage sites by private entities and bind participating bodies to its result.

#### ESPEC—they didn’t—that’s key to preserving neg flex to generate disad links and competition—anything else justifies infinite shiftiness that decks ground. Stick them with the counterplan—if they contest links, drop them.

#### Normal means is not done through new decision-making bodies—we read green.

1AC Harrington 19 – Andrea J. "Preserving Humanity's Heritage in Space: Fifty Years after Apollo 11 and beyond." J. Air L. & Com. 84 (2019): 299. (Associate Professor and Director of the Schriever Space Scholars at USAF Air Command and Staff College)//Elmer Recut Miller

The issue of humanity’s cultural heritage in space has arisen as one of many unanswered questions in space law, with no international agreements specifically addressing it. With the beginning of the space age fifty-six years ago and a series of remarkable achievements in space exploration behind us, it is necessary to determine what should be done regarding the “artifacts” of this exploration. NASA has promulgated their recommendations for spacefaring entities with the goal of protecting the lunar artifacts left behind by the Apollo missions.8 These recommendations establish “keep-out zones” of up to a four kilometer diameter with the aim of protecting the artifacts, particularly from dangerous, fastmoving particles that arise as a result of craft landings.9 Experience has shown that even artifacts that are sheltered by craters can be significantly sandblasted and pitted as a result of the moving particles.10 These recommendations, supposedly drafted in conformity with the Outer Space Treaty, however, are completely nonbinding.11 Legislation that has passed the U.S. Senate and is under consideration by the House of Representatives as of July 2019 would make these recommendations binding on U.S. entities seeking to land on the Moon.12 Accidental damage from unrelated missions, however, is only one of many threats to space artifacts. With the impending return to the Moon, it is likely that individuals and corporations will be looking to turn a profit from space heritage, without concern for the protection of such heritage. Tourists may disrupt sites with careless expeditions and landing sites may be desecrated so that the items can be sold. A Russian Lunakhod lunar rover has already been sold at auction to a private party, though it has not yet been moved from its original position on the Moon.13 While national heritage legislation can protect space artifacts from citizens of their own countries, there is currently no effective means in the present space law regime by which a country can protect its heritage from other countries.14 Both California and New Mexico have added Tranquility Base to their list of protected heritage sites.15 However, this solution, and those proposed in the bill put forth to the U.S. House of Representatives, only serve to restrict the activities of a small subset of the potential visitors to the Moon. Though the Senate bill calls for the President to initiate negotiations for a binding international agreement, there is still a long road from this bill to a potential agreement.16 A solution is needed to prevent the damage, destruction, loss, or private appropriation of our cultural heritage in space.

#### The CP applies intergenerational equity to future generations – every country would say yes.

Tan 2K [David Tan, LL.M., Harvard Law School; LL.B. (Hons), B.Com., University of Melbourne. Former Tutor in Law, Trinity College, University of Melbourne, “Towards a New Regime for the Protection of Outer Space as the "Province of All Mankind",” 2000, *The Yale Journal of International Law*, Vol. 25, https://digitalcommons.law.yale.edu/cgi/viewcontent.cgi?article=1114&context=yjil]

Edith Brown Weiss has advanced the theory of “intergenerational equity,” which provides for generational rights and obligations.158 Her thesis consists of a normative framework of intersecting theories of intergenerational and intragenerational equity that are derived from an underlying planetary trust, embodying the notion that generations act as stewards to sustain the welfare and well-being of all generations. This planetary trust obliges “each generation to preserve the diversity of the resource base and to pass the planet to future generations in no worse condition than it receives it.”159 The principle of the conservation of options requires each generation “to conserve the diversity of the natural and cultural resource base, so that it does not unduly restrict the options available to future generations in solving their problems and satisfying their own values, and should be entitled to diversity comparable to that enjoyed by previous generations.”\*60 The theory of intergenerational equity is an appealing one. Unfortunately, Weiss’s model generally rests upon an intertemporal human rights model for preserving the global environment. This presents many problems, ranging from the questionable existence of the right to a decent environment to the issue of remedies in respect of claims made by future generations against present generations.161

Whether the global awareness of the harm to our sense of intergenerational identity, as evidenced by the various U.N. General Assembly resolutions and numerous international conventions, will be sufficient to mobilize the implementation and enforcement of effective legal measures on behalf of future generations is doubtful. But more importantly, the notions of intergenerational identity and sustainable development will prove to be invaluable concepts in framing the discussion in Part VI.

Current literature has concentrated on the notion of sustainable development as involving the integration of economic and environmental considerations at all levels of decision-making.162 But the outer-space environment has been largely ignored, as if it were simply economic development on Earth that must be environmentally sound. There is no reason, however, why the precautionary principles that emerge from the concept of sustainable development in the Stockholm Declaration, the Rio Declaration, and the World Charter for Nature should not apply equally to the outer-space environment. Few states, if any, will take issue with the proposition that the exploration and use of outer space should be sustainable. It is in the common interest of all states, whether spacefaring or otherwise, to subscribe to a regime that allows for the development of space activities in a manner that leaves the space environment in a substantially unimpaired condition for future generations. One might even ultimately find that the uniqueness and vulnerability of the outer-space environment demand that the international community as a whole recognize sustainable development as a “global ethic”163 that transcends terrestrial boundaries, as a peremptory norm that prohibits “policies and practices that support current living standards by depleting the productive base, including natural resources, and that leaves future generations with poorer prospects and greater risks than our own.”164 We should not confine our actions to those we are now able to determine as directly or indirectly benefiting ourselves or our descendants. On the contrary, we should “cultivate our natural sense of obligation not to act wastefully or wantonly even when we cannot calculate how such acts would make any present or future persons worse off.”165 It seems impossible to find universally agreed-upon limits on the freedom of exploration and use of outer space. Rather than focus on indeterminate rules of custom-formation, we should concentrate on establishing fair and workable arrangements and institutions that can successfully accommodate the competing interests of all nations. With these guidelines in mind, we will now examine new methods of treaty-making that will enhance the willingness of states to participate in an environmental program that seeks to achieve an acceptable balance between pollution control and freedom of space exploration.

#### Discounting future generations causes extinction – only formalizing a mechanism to weight their concerns solves

Jones et al 18 [Natalie Jones, Mark O'Brien, and Thomas Ryan, University of Cambridge, United Kingdom. Representation of future generations in United Kingdom policy-making. Futures Volume 102, September 2018, Pages 153-163. https://www.sciencedirect.com/science/article/pii/S0016328717301179#sec0005]

Global catastrophic and existential risks pose central challenges for intergenerational justice and the structure of our current democracy. The Global Challenges Report 2016 defines global catastrophic risk as risk of an ‘event or process that, were it to occur, would end the lives of approximately 10% or more of the global population, or do comparable damage’ (Global Challenges Foundation & Global Priorities Project, 2016). A subset of catastrophic risks are ‘existential’ risks, which would end human civilisation or lead to the extinction of humanity (Global Challenges Foundation & Global Priorities Project, 2016). Catastrophic and existential risks may be categorised in terms of ongoing risks, which could potentially occur in any given year (e.g. nuclear war; pandemics), versus emerging risks which may be unlikely today but will become significantly more likely in the future (e.g. catastrophic climate change; risks stemming from emerging technologies). Ongoing risks have existed for some time now and are generally well-understood. However, emerging risks, particularly those arising from technological developments, are less understood and demand increasing attention from scientists and policymakers. These technological developments include advances in synthetic biology, geoengineering, distributed manufacturing and artificial intelligence (AI) (Global Priorities Project, Future of Humanity Institute, Oxford Martin School, Centre for the Study of Existential Risk, 2014). Although the impact of these technologies is still very uncertain, expert estimates suggest a non-negligible probability of catastrophic harm. In this article we rely on two main premises. The first is that future generations are under-represented in current political structures partly due to political ‘short-termism’ or ‘presentism’ (Thompson, 2010). Governments primarily focus on short-term concerns, which mean that they may systematically neglect global catastrophic risks and, accordingly, future generations (Global Priorities Project et al., 2014). The problem of presentism transcends political divisions: people across the political spectrum are concerned about its effects, and should care about mitigating global catastrophic risks. This situation is exacerbated in that the good of mitigating global catastrophic and existential risks is typically global. Individual political actors (even whole countries) bear many costs in providing for such goods, whereas the benefits are dispersed globally. In addition to the benefits of mitigating existential risks being global, many of the beneficiaries are future people who do not exist presently and as such have no voice in the political process. There is a clear lack of incentives to mitigate such risks, and market failure should be expected (Beckstead, 2013). The second key assumption is that we as a society consider the rights and interests of future generations to be important. It is beyond the scope of this paper to present a complete account of the philosophical arguments on this matter. It is sufficient to note that although significant philosophical problems have been pointed out, chiefly due to the fact that the actions of present people have a causal impact on the values, number and identity of future individuals (Parfit, 1984), there are several theories of intergenerational justice that may support this assumption (Gosseries, 2008). The need to include explicit pathways in governance structures for accountability to the rights and needs of future generations has been noted (Global Priorities Project et al., 2014). Some thought has been put into how future generations may be represented in relation to environmental risks such as climate change, resource depletion and biodiversity loss; this research is reflected in the sustainable development literature (Brown Weiss, 1990). However, this problem has not been explored in relation to society’s burgeoning awareness of technology-related catastrophic and existential risks. In addition, such pathways have not been fully explored in the United Kingdom (UK) context. This policy paper hopes to fill this gap in the literature.

## 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.

#### Aff doesn’t solve one brush of a tourist’s hand from Fessl– 1AC ev doesn’t make a distinction between how touching a lunar site triggering the impact from private entities is different from NASA scientists walking on a lunar site to collect space dust

#### 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.

### 1NC – Warming

#### 1] There’s a disconnect between their solvency and the impact – Lunar Bases being able to observe when massive warming 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.

#### 2] Populist Climate Deniers don’t act regardless of Data – proves it’s not data that’s key but will.

#### 3] ISS and space stations solve resources – only moon key warrant is lack of atmospheric interference

#### 4] AI solves better

NERSC 21 “Deep-learning model speeds extreme weather predictions” DECEMBER 8, 2021 National Energy Research Scientific Computing Center [National Energy Research Scientific Computing Center] <https://phys.org/news/2021-12-deep-learning-extreme-weather.html> SM

Deep-learning model speeds extreme weather predictionsA depiction of digital twin Earth adapted from the EU's Destination Earth project. Climate change is one of the greatest challenges facing humanity today. To help address this, researchers from Lawrence Berkeley National Laboratory (Berkeley Lab), Caltech, and NVIDIA trained the Fourier Neural Operator (FNO) deep learning model—which learns complex physical systems accurately and efficiently—to emulate atmospheric dynamics and provide high-fidelity extreme weather predictions across the globe a full five days in advance.The researchers used decades of data from ERA5, the European Center for Medium-range Weather Forecasts' high-resolution Earth dataset, to train the FNO model, which was scaled up to 128 NVIDIA A100 GPUs on Perlmutter, the new HPC system at the National Energy Research Scientific Computing Center (NERSC). The team developed a global FNO weather forecasting model at 30-km resolution, an order of magnitude greater resolution than state-of-the-art deep learning Earth emulators. The model predicts wind velocities and pressures at multiple levels in the atmosphere up to 120 hours in advance with high fidelity. In a case study on the massive 2016 hurricane Matthew, the model's predictions of the hurricane's winds and track were within the uncertainties of the NOAA National Hurricane Center's forecast cones. In addition, the model can predict the behavior of certain classes of extreme weather events across the globe days in advance in just 0.25 seconds on a single NVIDIA GPU. Physics-informed deep learning models such as the FNO offer the potential for accurate predictions of the spatio-temporal evolution of the Earth system orders of magnitude faster than traditional numerical models. This is an ongoing effort, and the team is investigating the comparative accuracy of deep learning and traditional numerical weather models in collaboration with experts in atmospheric modeling and numerical weather prediction. The FNO model developed through the Berkeley Lab/Caltech/NVIDIA collaboration is a significant step toward building a digital twin Earth, the researchers noted. Digital twin Earths are digital replicas of planet Earth—simulators grounded in physics, driven by AI, and constrained by real-time data. As described in the ambitious 10-year EU project Destination Earth, a digital twin Earth will give both expert and non-expert users tailored access to high-quality information, services, models, forecasts, and visualizations in the realms of climate monitoring, modeling, mitigation, and adaptation. This video shows a demonstration of digital twin Earth using the FNO model. The FNO climate collaboration was one of several science success stories described by NVIDIA co-founder and CEO Jensen Huang during a keynote presentation at the recent GPU Technology Conference. In his talk, Huang emphasized that the combination of accelerated computing, physics, machine learning, and giant computer systems can provide "a million-x leap" to enable simulating and predicting climate change reliably and accurately.

### 1NC – Prolif

#### 1] No impact – their ev says neutrino research has been lacking for decades BUT no second gen proliferators since North Korea – proves monitoring isn’t key and no impact to prolif it causes

#### 2] Nuclear prolif solves peace – studies

Suzuki 15 [June 2015, Akisato, Researcher, Institute for International Conflict Resolution and Reconstruction, School of Law and Government, Dublin City University, MA in Violence, Terrorism and Security at Queen's University, “Is more better or worse? New empirics on nuclear proliferation and interstate conflict by Random Forests,” Research and Politics, SagePub]

Random Forests has three attractive and distinctive characteristics for the purposes of this paper: first, the estimation of conditional variable importance and partial dependence plots enable conventional applied researchers to interpret non-parametric analysis in an intuitive way; second, Random Forests can examine non-linearity (Strobl et al., 2009: 339–341), which is desirable because, as already noted, some theories expect non-linearity between nuclear proliferation and a systemic propensity for conflict; and finally, it can cope with potential interactions and multicollinearity between regressors (Strobl et al., 2009: 339–341; Strobl et al., 2008). As noted before, most of the regressors here are highly correlated, and also it is plausible to anticipate some interaction effect between them (e.g. the number of democratic states and the gross world product). The specific capabilities of Random Forests are therefore essential. The estimation of conditional variable importance shows that the nuclear year counter has a negative importance score.7 Thus, the nuclear year counter is not important in explaining the dispute–state ratio. This suggests that the optimist theory is supported. The remaining regressors have an importance score higher than the absolute value of the importance score of the nuclear year counter, meaning that they are all important. Controlling for democratic peace, capitalist peace, and polarity, the number of nuclear states is still a significant predictor in explaining a systemic propensity for interstate conflict. Figure 1 presents the partial dependence plots of the model.8 First, on average, a larger number of nuclear states is associated with a lower dispute–state ratio, although the changes from two nuclear states to three and from six to seven increase the ratio instead. Thus, the relationship is empirically non-linear, as Bueno de Mesquita and Riker (1982) and Intriligator and Brito (1981) expected in part. Overall, however, the optimist theory is supported, and the change from two nuclear states to nine nuclear states decreases the dispute–state ratio approximately from 0.228 to 0.18. This means that, if there are 194 states in the system (as there were in 2009), the number of militarized interstate dispute onsets per system-year decreases approximately from 44 to 35. This is a substantively significant decline. Second, the nuclear year counter shows a concave relationship with the dispute–state ratio, suggesting that new nuclear states are less prone to conflict than middle-aged nuclear states. Thus, the pessimist theory finds no support from either the variable importance estimation or the partial dependence plot. Finally, as for the control variables, the number of democratic states and the gross world product have a complex non-linear relationship with the dispute–state ratio, but if the number of democratic states and the gross world product are sufficiently large, they tend to decrease the dispute–state ratio. Their substantive effects are also significant, though not as much as the number of nuclear states. When comparing the effect of their lowest and highest values (23 and 94 in the number of democratic states and 7 and 71.2 in the gross world product), the number of democratic states decreases the number of militarized interstate dispute onsets per system-year approximately from 40 to 37, and the gross world product from 44 to 37. Unipolarity is also associated with a decline in the dispute–state ratio, suggesting that unipolarity is better than bipolarity in terms of a systemic propensity for interstate conflict; however, its effect is negligible, as it reduces the number of militarized interstate dispute onsets per system-year from 39 to 38. One caveat is, as explained in the online appendix, that the results of the number of democratic states and unipolarity are significantly sensitive to a parameter setting. Thus, these predictors are less robust, and the aforementioned points about them should be treated with caution. Discussion and concluding remarks The main findings reveal that the optimist expectation of the relationship between nuclear proliferation and interstate conflict is empirically supported:9 first, a larger number of nuclear states on average decreases the systemic propensity for interstate conflict; and second, there is no clear evidence that the emergence of new nuclear states increases the systemic propensity for interstate conflict. Gartzke and Jo (2009) argue that nuclear weapons themselves have no exogenous effect on the probability of conflict, because when a state is engaged in or expects to engage in conflict, it may develop nuclear weapons to keep fighting, or to prepare for, that conflict. If this selection effect existed, the analysis should overestimate the conflict-provoking effect of nuclear proliferation in the above model. Still, the results indicate that a larger number of nuclear states are associated with fewer disputes in the system. This conclusion, however, raises questions about how to reconcile this study’s findings with those of a recent quantitative dyadic-level study (Bell and Miller, 2015). The current paper finds that nuclear proliferation decreases the systemic propensity for interstate conflict, while Bell and Miller (2015) find that nuclear symmetry has no significant effect on dyadic conflict, but that nuclear asymmetry is associated with a higher probability of dyadic conflict. It is possible that nuclear proliferation decreases conflict through the conflict-mitigating effects of extended nuclear deterrence and/or fear of nuclear states’ intervention, to the extent that these effects overwhelm the conflict-provoking effect of nuclear–asymmetrical dyads. Thus, dyadic-level empirics cannot solely be relied on to infer causal links between nuclear proliferation and a systemic propensity for conflict. The systemic-level empirics deserve attention.