### 1

#### Interpretation: private entities is a generic bare plural. The aff may not defend that the appropriation of outer space by a subset of private entities is unjust.

Nebel 19 Jake Nebel [Jake Nebel is an assistant professor of philosophy at the University of Southern California and executive director of Victory Briefs.] , 8-12-2019, "Genericity on the Standardized Tests Resolution," Briefly, https://www.vbriefly.com/2019/08/12/genericity-on-the-standardized-tests-resolution/ SM

Both distinctions are important. Generic resolutions can’t be affirmed by specifying particular instances. But, since generics tolerate exceptions, plan-inclusive counterplans (PICs) do not negate generic resolutions. Bare plurals are typically used to express generic generalizations. But there are two important things to keep in mind. First, generic generalizations are also often expressed via other means (e.g., definite singulars, indefinite singulars, and bare singulars). Second, and more importantly for present purposes, bare plurals can also be used to express existential generalizations. For example, “Birds are singing outside my window” is true just in case there are some birds singing outside my window; it doesn’t require birds in general to be singing outside my window. So, what about “colleges and universities,” “standardized tests,” and “undergraduate admissions decisions”? Are they generic or existential bare plurals? On other topics I have taken great pains to point out that their bare plurals are generic—because, well, they are. On this topic, though, I think the answer is a bit more nuanced. Let’s see why. 1.1 “Colleges and Universities” “Colleges and universities” is a generic bare plural. I don’t think this claim should require any argument, when you think about it, but here are a few reasons. First, ask yourself, honestly, whether the following speech sounds good to you: “Eight colleges and universities—namely, those in the Ivy League—ought not consider standardized tests in undergraduate admissions decisions. Maybe other colleges and universities ought to consider them, but not the Ivies. Therefore, in the United States, colleges and universities ought not consider standardized tests in undergraduate admissions decisions.” That is obviously not a valid argument: the conclusion does not follow. Anyone who sincerely believes that it is valid argument is, to be charitable, deeply confused. But the inference above would be good if “colleges and universities” in the resolution were existential. By way of contrast: “Eight birds are singing outside my window. Maybe lots of birds aren’t singing outside my window, but eight birds are. Therefore, birds are singing outside my window.” Since the bare plural “birds” in the conclusion gets an existential reading, the conclusion follows from the premise that eight birds are singing outside my window: “eight” entails “some.” If the resolution were existential with respect to “colleges and universities,” then the Ivy League argument above would be a valid inference. Since it’s not a valid inference, “colleges and universities” must be a generic bare plural. Second, “colleges and universities” fails the upward-entailment test for existential uses of bare plurals. Consider the sentence, “Lima beans are on my plate.” This sentence expresses an existential statement that is true just in case there are some lima beans on my plate. One test of this is that it entails the more general sentence, “Beans are on my plate.” Now consider the sentence, “Colleges and universities ought not consider the SAT.” (To isolate “colleges and universities,” I’ve eliminated the other bare plurals in the resolution; it cannot plausibly be generic in the isolated case but existential in the resolution.) This sentence does not entail the more general statement that educational institutions ought not consider the SAT. This shows that “colleges and universities” is generic, because it fails the upward-entailment test for existential bare plurals. Third, “colleges and universities” fails the adverb of quantification test for existential bare plurals. Consider the sentence, “Dogs are barking outside my window.” This sentence expresses an existential statement that is true just in case there are some dogs barking outside my window. One test of this appeals to the drastic change of meaning caused by inserting any adverb of quantification (e.g., always, sometimes, generally, often, seldom, never, ever). You cannot add any such adverb into the sentence without drastically changing its meaning. To apply this test to the resolution, let’s again isolate the bare plural subject: “Colleges and universities ought not consider the SAT.” Adding generally (“Colleges and universities generally ought not consider the SAT”) or ever (“Colleges and universities ought not ever consider the SAT”) result in comparatively minor changes of meaning. (Note that this test doesn’t require there to be no change of meaning and doesn’t have to work for every adverb of quantification.) This strongly suggests what we already know: that “colleges and universities” is generic rather than existential in the resolution. Fourth, it is extremely unlikely that the topic committee would have written the resolution with the existential interpretation of “colleges and universities” in mind. If they intended the existential interpretation, they would have added explicit existential quantifiers like “some.” No such addition would be necessary or expected for the generic interpretation since generics lack explicit quantifiers by default. The topic committee’s likely intentions are not decisive, but they strongly suggest that the generic interpretation is correct, since it’s prima facie unlikely that a committee charged with writing a sentence to be debated would be so badly mistaken about what their sentence means (which they would be if they intended the existential interpretation). The committee, moreover, does not write resolutions for the 0.1 percent of debaters who debate on the national circuit; they write resolutions, at least in large part, to be debated by the vast majority of students on the vast majority of circuits, who would take the resolution to be (pretty obviously, I’d imagine) generic with respect to “colleges and universities,” given its face-value meaning and standard expectations about what LD resolutions tend to mean.

#### It applies to private entities:

#### Upward entailment test – spec fails the upward entailment test because saying that one company’s appropriation is bad does not entail that all companies’ appropriation is bad

#### Adverb test – adding “usually” to the res doesn’t substantially change its meaning

#### Vote neg:

#### 1] Precision –any deviation justifies the aff arbitrarily jettisoning words in the resolution at their whim which decks negative ground and preparation because the aff is no longer bounded by the resolution.

#### 2] Limits—specifying a type of appropriation offers huge explosion in the topic since they get permutations of hundreds of governments, specific companies, and different sectors in the world.

#### Drop the debater to preserve fairness and education – use competing interps –reasonability invites arbitrary judge intervention and a race to the bottom of questionable argumentation

#### Hypothetical neg abuse doesn’t justify aff abuse, and theory checks cheaty CPs

#### No RVIs—it’s their burden to be topical.

### 2

#### The appropriation of outer space by private entities in Ukraine that sell parts for ballistic missiles to North Korea and/or that are invested in by the Chinese is unjust.

### 3

#### Russian ethno-nationalism is fringe now because of Putin’s strength – he’ll align to regain clout, causing global war

Wiechnik 19, [Stanley Wiechnik is a prior-enlisted officer in the U.S. Army Reserve, serves in the Office of the Chief Army Reserve, and writes on political legitimacy and democratization, Russian Identity: The Risks of a New Russian Nationalism, March 12, https://www.realcleardefense.com/articles/2019/03/12/russian\_identity\_the\_risks\_of\_a\_new\_russian\_nationalism\_114255.html]

As one threat passes another may be on the rise. This is the potential for the new Russian identity to merge with a new Russian ideology. At the same time Russians lost their identity as the vanguard of the workers revolution, they lost their ideology. Communism was a failure. Russia felt the sting of the collapse of communism so acutely that they included a provision in their new constitution that there would be no single ideology.[16] But over the years, as sovereign democracy and the new Russian identity began to form, some new ideas about where Russia should move ideologically began to be discussed. The one that may present the greatest threat is an updated fascist ideology that seems to be gaining ground in Russia.

Russia’s recent history may favor the rise of fascism. There are historical parallels between Germany prior to fascism’s success there and Russia’s recent experiences. Like Russia, Germany has a long history but only became a unified state in 1871. It was still creating its national identity when fascism came along 50 years later. Germany had suffered defeat and had a brief-but-failed attempt at liberal democracy. Germany had suffered an economic collapse that hastened the end of the democratic experiment and caused Germans to seek a strong leader. A similar set of circumstances could be laid out for Italy, which also only reunified in 1871 and saw the rise of fascism a decade before Germany. If there is a set a precursors events that favor the rise of fascism, it would appear Russia has experienced many of them.

At first this seems patently absurd. The Great Patriot War, or World War II for the rest of us, has always been portrayed as Russia’s victory against fascist Nazi Germany. To sidestep this thorny issue, a popular Russian political philosopher has created a narrative that rebrands fascist ideology as something new and potentially very Russian. In Fourth Political Theory Alexander Dugin claims the three great political philosophies—Liberalism, Fascism, and Communism—have all failed. Russia must now create a new ideology.[17] But what Dugin advocates is a form of neo-fascist Eurasionism.[18] Eurasionists believed various historical, geographical, linguistic, and other unifying characteristics of the territory of the Tsarist and Soviet empires were sufficiently unique to declare the existence of a separate Eurasian civilization, different from what they called the Romano-Germanic culture of Central and Western Europe. Dugin’s version of Eurasionism is radically anti-Western. It is very much in line with the concept of Russiky Mir. Luckily, Dugin’s ideas are currently considered extreme, and while he is gaining in popularity he is still a fringe personality.[19] Yet, his ideas offer a view of a potential future where Russia creates a new ideology all its own, based on a deeply anti-Western form of neo-fascist Eurasianist identity.[20]

In the near-term, it is unlikely ideas like Dugin’s will gain a foothold in mainstream Russian politics, at least while Putin is still in charge. For now, Russia has less of an ideology than a cult of personality. Putin means more to the Russian people as the nation’s leader than the institution of the presidency or the constitution.[21] But Putin cannot stay in power forever. As his popularity wanes, he may seek to garner support from whatever sector he thinks he can control. His change in language from rossisskiy to russkiy could be seen as a sign that ethnic nationalism may be gaining strength in Russia and he is willing to align himself with it where it suits him.

What is clear is that Putin will not remain in power forever. Over the next two decades he will likely lose control and be replaced. Through his consolidation of power he has set the stage for another strong central leader to take over. It is likely that Russia will continue to develop its identity and its own political ideology. Who comes after Putin, and what ideology they espouse, may pose a significant risk to Western countries.

Conclusion

The Russian people are still somewhat malleable when it comes to their identity and political ideology. Where they see themselves in relation to other European and Western countries can have a profound impact on their near abroad in the immediate future, as well as the world as time goes on. The opportunity for extraterritorial adventurism based on stranded compatriots may be passing, but a new threat may still await us in the near future. What ideology Russia embraces may pose a wider threat beyond their near abroad. The current vector does seem to be towards a system that is capitalist, centrally managed with a strong individual leader, has a utilitarian socialist or corporate slant, and formed around a newfound ethnic identity. These are similar to the basic building blocks of fascism.[22] But events could cause it to change direction towards liberalism or, even more unlikely, a return to communism. It is too soon to tell. But how Russia develops its identity and ideology will likely pose a potential threat both currently and over then next few decades.

#### The plan’s a huge loss that destroys regime legitimacy

Khakimov 17, [Grigory Khakimov is a recent graduate from Tufts University with a degree in Political Science focusing on Comparative Politics and the post-Soviet region. Before moving to the United States, he was a member of the Russian Democratic Party Yabloko, 1-21-2017, "U.S. Foreign Policy and the Russian Challenge: Is a Trump Reset Possible?," JIA SIPA, <https://jia.sipa.columbia.edu/online-articles/trump-russia-reset>]

The Trump Administration must not discount that all three aforementioned issues are tightly connected with Russia’s domestic politics. The previous [reset](http://foreignpolicy.com/2016/12/09/the-russian-reset-that-never-was-putin-obama-medvedev-libya-mikhail-zygar-all-the-kremlin-men/), initiated by the Obama Administration in 2009 right after the 2008 Russo-Georgian War, was interrupted by the Kremlin. During the last reset, important steps signaling improvement in the two countries’ bilateral relations were made. In 2010 presidents Barak Obama and Dmitry Medvedev signed the New START, a strategic arms control treaty, pledging to reduce the nuclear weapons of both countries. Russia and the U.S. were also aligned in the imposing sanctions on Iran for its nuclear program and supporting the NATO-led intervention in Libya. Moscow allowed the U.S. and NATO military forces to pass through Russia into Afghanistan, and, in turn, Russia received American support to join the [WTO](http://www.ictsd.org/bridges-news/bridges/news/russia-finds-us-support-in-wto-accession-efforts-though-obstacles-remain). The short-lived cooperation ended in 2012 when Putin returned to his third term of presidency. He personally [blamed](http://www.nytimes.com/2011/12/09/world/europe/putin-accuses-clinton-of-instigating-russian-protests.html) then-Secretary of State Hillary Clinton for fomenting the mass demonstrations against the 2011 fraudulent parliamentary election. The regime began searching for instigators of the color revolution in Russia, introducing the so-called foreign agents and undesirable organizations laws vis-à-vis independent civil society groups. In response to the [U.S. Magnitsky Act](http://www.nytimes.com/2012/12/07/business/global/senate-passes-russian-trade-bill-with-conditions.html), the State Duma [passed](https://www.washingtonpost.com/world/europe/russia-set-to-ban-us-adoptions/2012/12/27/fd49c542-504f-11e2-8b49-64675006147f_story.html?utm_term=.4f248a205703) the Dima Yakovlev Law, ending adoptions of Russian children by U.S. citizens. The legal restrictions on meetings and demonstrations were tightened, allowing agents of the Federal Security Service (the former KGB) to open fire on crowds. The increasing authoritarian practices inside the country continued to develop in parallel with Russia’s military interventions in Ukraine and Syria. An expansionist foreign policy became a crucial mechanism to legitimize the Putin regime by mobilizing public support. Stirring up anti-American and anti-European discourses, the rhetoric of nuclear war fears, nationalism, and post-Soviet resentment, the state media disseminates the image of Russia as a rising “great power” (derzhava). After the 2014 events in Ukraine, Russia was presented as a “besieged fortress” protecting stability in Eurasia and saving the post-Soviet region from the so-called U.S.-backed color revolutions. Since the beginning of the operation in Syria, the Russian government has propagated itself as a military world power fighting against international terrorism and challenging the U.S. strategic interests in the Middle East. As a result of such narrative of emergency, Putin’s approval rating has reached [86 percent](http://www.levada.ru/indikatory/odobrenie-organov-vlasti/). Today, [90 percent](http://wciom.ru/index.php?id=236&uid=115866)of Russians are proud of the country’s military forces and [72 percent](http://wciom.ru/index.php?id=236&uid=115866) support Russia’s position in the international arena. This rally ‘round the flag narrative seems to prevail despite a continuous domestic economic recession due to low oil prices, capital flight, and Western sanctions blocking the inflow of foreign direct investments necessary for the modernization of the Russian economy. Russians’ living standards and consumption levels are dropping while the growth of defense spending occurs only at the expense of the welfare budget. The Kremlin faces a catch-22, which includes ongoing isolation and confrontation with the West that threatens the socio-economic stability of the regime. By contrast, any turn towards cooperation can destroy the regime’s public image, hinting at weakness and collusion with Washington. Most importantly, the Trump Administration must be aware of the domestic contradictions of the Putin regime in trying to align U.S. and Russian interests relative to nuclear issues as well as the conflicts in Syria and Ukraine. The Putin regime, in efforts to maintain public support, may continue its unpredictable modus operandi, keeping the world in a state of suspense.

#### Putin lashes out with a diversionary war – 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

#### The appropriation of outer space by private entities in Ukraine is unjust except in the case of asteroid mining.

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

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

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

#### Space regulation scares investors away and spills over to other space activities. Freeland 05

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

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

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

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

How much, exactly? We’re only just beginning to guess. [Asterank](http://www.asterank.com/), a service that keeps track of some 6,000 asteroids in NASA’s database, prices out the estimated mineral content in each one in the current world market. More than 500 are listed as “>$100 trillion.” The estimated profit on just the top 10 asteroids judged “most cost effective” — that is, the easiest to reach and to mine, subtracting rocket fuel and other operating costs, is around $1.5 trillion.¶ Is it ours for the taking? Well, here’s the thing — we’re taking it already, and have been doing so since we started mining metals thousands of years ago. Asteroid strikes are the only reason rare metals exist in the Earth’s crust; the native ones were all sucked into our planet’s merciless iron core millions of years ago. Why not go to the source?¶ As a side project, space mining can grab water from the rocks and comets — water which, with a little processing makes rocket fuel. Which in turn makes even more currently unimaginable space operations possible, including ones that could give the planet all the energy it needs to avert climate catastrophe. Cislunar space — the bit around us and the moon, the local neighborhood, basically — is about to get very interesting.¶ It’s hard, even for the most asteroid-minded visionaries, to truly believe the full scope of this future space economy right now. Just as hard as it would have been in 1945, when an engineer named Vannevar Bush first proposed [a vast library of shared knowledge that people the world over would access via personal computers](https://en.wikipedia.org/wiki/Memex), to see that mushroom into a global network of streaming movies and grandmas posting photos and trolls and spies who move the needle on presidential elections. ¶ No technology’s pioneer can predict its second-order effects.¶ The space vision thing is particularly difficult in 2019. Not only do we have plenty of urgent problems with democracy and justice to keep us occupied, but the only two companies on the planet to have gone public with asteroid-mining business plans, startups that seemed to be going strong and had launched satellites already, were just bought by larger companies that are, shall we say, less comfortable executing on long-term visions.¶ Planetary Resources was founded in 2012 in a blaze of publicity. Its funding came from, among others, Larry Page, Eric Schmidt, Ross Perot, and the country of Luxembourg. It had inked an orbital launch deal with Virgin Galactic. And it was sold last October to a blockchain software company. (To 21st century readers, this paragraph would look like I’m playing tech world mad libs.)¶ In January, the other company, Deep Space Industries, also partly funded by Luxembourg (way to get in the space race, Luxembourg!), was sold to Bradford Space, owned by a U.S. investment group called the American Industrial Acquisition Corporation. Maybe these new overlords plan on continuing their acquisitions' asteroid mining endeavors rather than stripping the companies for parts. Both companies have been notably silent on the subject. “The asteroid mining bubble has burst,” [declared The Space Review](http://www.thespacereview.com/article/3633/1), one of the few online publications to even pay attention.¶ That’s also to be expected. After all, anyone trying to build Google in 1945 would go bankrupt. Just as the internet needed a half-dozen major leaps forward in computing before it could even exist, space industry needs its launch infrastructure.¶ Currently, the world’s richest person and its most well-known entrepreneur, Jeff Bezos and Elon Musk, respectively, are working on the relatively cheap reusable rockets asteroid pioneers will need. (As I was writing this, Bezos announced in an email blast that one of his New Shepherd rockets had flown to space and back five times like it was nothing, delivering 38 payloads for various customers while remaining entirely intact.) ¶ Meanwhile, quietly, Earth’s scientists are laying the groundwork of research the space economy needs. Japan’s Hayabusa 2 spacecraft has been in orbit around asteroid Ryugu for the last year and a half, learning everything it can. (Ryugu, worth $30 billion according to Asterank, is the website's #1 most cost-effective target.) The craft dropped [tiny hopping robot rovers](https://www.space.com/41941-hayabusa2-asteroid-rovers-hopping-tech.html) and a [small bomb](https://www.space.com/japan-hayabusa2-asteroid-bomb-video.html) on its target; pictures of the small crater that resulted were released afterwards.¶ Officially, the mission is to help us figure out how the solar system formed. Unofficially, it will help us understand whether all those useful metals clump together at the heart of an asteroid, as some theorize. If so, it’s game on for asteroid prospectors. If not, we can still get at the metals with other techniques, such as optical mining (which basically involves sticking an asteroid in a bag and drilling with sunlight; sounds nuts to us, but [NASA has proved it in the lab](https://www.nasa.gov/directorates/spacetech/niac/2017_Phase_I_Phase_II/Sustainable_Human_Exploration/)). It’ll just take more time.¶ Effectively, we’ve just made our first mark at the base of the first space mineshaft. And there’s more to come in 2020 when Hayabusa 2 returns to Earth bearing samples. If its buckets of sand contain a modicum of gold dust, tiny chunks of platinum or pebbles of compressed carbon — aka diamonds — then the Duchy of Luxembourg won’t be the only deep-pocketed investor to sit up and take notice.¶ The possibility of private missions to asteroids, with or without a human crew, is almost here. The next step in the process that takes us from here to where you are? Tell us an inspiring story about it, one that makes people believe, and start to imagine themselves mining in space. How would you explain the world-changing nature of the internet to 1945? How would you persuade them that there was gold to be mined in Vannevar Bush’s idea? You’d let the new economy and its benefits play out in the form of a novel.¶ As Hayabusa dropped a bomb on Ryugu, Daniel Suarez was making the exact same asteroid the target of his fiction. Suarez is a tech consultant and developer turned New York Times bestselling author. His novels thus far have been techno-thrillers: his debut, [Daemon](https://www.amazon.com/dp/B003QP4NPE/ref=dp-kindle-redirect?_encoding=UTF8&btkr=1), a novel of Silicon Valley’s worst nightmare, AI run rampant, made more than a million dollars.¶ So it was a telling shift in cultural mood that Suarez’s latest thriller is also a very in-depth description of — and thinly-disguised advocacy for — asteroid mining. In [Delta-v](https://www.amazon.com/Delta-v-Daniel-Suarez-ebook/dp/B07FLX8V84/ref=sr_1_1?crid=UMNUUSR3NCBX&keywords=delta-v&qid=1556930756&s=digital-text&sprefix=delta-v%2Cdigital-text%2C204&sr=1-1), published in April, a billionaire in the 2030s named Nathan Joyce recruits a team of adventurers who know nothing about space — a world-renowned cave-diver, a world-renowned mountaineer — for the first crewed asteroid mission.¶ Elon Musk fans might expect this to be Joyce’s tale, but he soon fades into the background. The asteroid-nauts are the true heroes of Delta-v. Not only are they offered a massive payday — $6 million each for four years’ work — they also have agency in key decisions in the distant enterprise. Suarez deliberately based them on present-day heroes. The mission is essential, Joyce declares, to save Earth from its major problems. First of all, the fictional billionaire wheels in a fictional Nobel economist to demonstrate the actual truth that the entire global economy is sitting on a [mountain of debt](https://www.washingtonpost.com/opinions/the-247-trillion-global-debt-bomb/2018/07/15/64c5bbaa-86c2-11e8-8f6c-46cb43e3f306_story.html?noredirect=on&utm_term=.5fb3ff1155d9). It has to keep growing or it will implode, so we might as well take the majority of the industrial growth off-world where it can’t do any more harm to the biosphere.¶ Secondly, there’s the climate change fix. Suarez sees asteroid mining as the only way we’re going to build [solar power satellites](https://en.wikipedia.org/wiki/Space-based_solar_power). Which, as you probably know, is a form of uninterrupted solar power collection that is theoretically more effective, inch for inch, than any solar panels on Earth at high noon, but operating 24/7. (In space, basically, it’s always double high noon). ¶ The power collected is beamed back to large receptors on Earth with large, low-power microwaves, which researchers think will be harmless enough to let humans and animals pass through the beam. A space solar power array like [the one China is said to be working on](https://www.forbes.com/sites/scottsnowden/2019/03/12/solar-power-stations-in-space-could-supply-the-world-with-limitless-energy/#2d3f78a54386) could reliably supply 2,000 gigawatts — or over 1,000 times more power than the largest solar farm currently in existence. ¶ “We're looking at a 20-year window to completely replace human civilization's power infrastructure,” Suarez told me, citing the report of the Intergovernmental Panel on Climate Change on the coming catastrophe. Solar satellite technology “has existed since the 1970s. What we were missing is millions of tons of construction materials in orbit. Asteroid mining can place it there.”¶ The Earth-centric early 21st century can’t really wrap its brain around this, but the idea is not to bring all that building material and precious metals down into our gravity well. Far better to create a whole new commodities exchange in space. You mine the useful stuff of asteroids both near to Earth and far, thousands of them taking less energy to reach than the moon. That’s something else we’re still grasping, how relatively easy it is to ship stuff in zero-G environments. ¶ Robot craft can move 10-meter boulders like they’re nothing. You bring it all back to sell to companies that will refine and synthesize it in orbit for a myriad of purposes. Big pharma, to take one controversial industry, would [benefit by taking its manufacturing off-world](https://medium.com/fitch-blog/why-is-big-pharma-interested-in-the-space-economy-c078ac1bf67c). The molecular structure of many chemicals grows better in microgravity.¶ The expectation is that a lot of these space businesses — and all the orbital infrastructure designed to support them — will be automated, controlled remotely via telepresence, and monitored by AI. But Suarez is adamant that thousands if not millions of actual human workers will thrive in the space economy, even as robots take their jobs in old industries back on Earth.¶ “Our initial expansion into space will most likely be unsettled and experimental. Human beings excel in such environments,” he says. “Humans can improvise and figure things out as we go. Robots must be purpose-built, and it's going to take time and experience for us to design and build them.”¶ Which is another way startups back on Earth will get rich in the new economy: designing and building those robots, the nearest thing to selling picks and shovels to prospectors in the space gold rush. Thousands of humans in space at any one time will also require the design and construction of stations that spin to create artificial gravity. Again, this isn’t a great stretch: Using centrifugal force to simulate gravity in space was first proposed by scientists in the 19th century. NASA has had workable designs for spinning cislunar habitats called [O’Neill cylinders](https://en.wikipedia.org/wiki/O%27Neill_cylinder) since the 1970s. We just haven’t funded them. ¶ But the trillionaires clearly will.¶ In short, Suarez has carefully laid out a vision of the orbital economy that offers something for everyone in our divided society. For Green New Deal Millennials, there’s the prospect of removing our reliance on fossil fuels at a stroke and literally lifting dirty industries off the face of the planet. For libertarians and other rugged individualists, there’s a whole new frontier to be developed, largely beyond the reach of government. ¶ For those who worry about asteroids that could wipe out civilization — though luckily, [this isn't likely to happen any time soon](https://mashable.com/article/armageddon-asteroid-threat) — here is a way for humanity to get proficient in moving them out of the way, fast. Indeed, the National Space Society has offered [a proposal](https://space.nss.org/technologies-for-asteroid-capture-into-earth-orbit/) to capture the asteroid Aphosis (which is set to miss Earth in the year 2029, but [not by a very comfortable margin](https://www.space.com/asteroid-apophis-2029-flyby-planetary-defense.html)), keep it in orbit, and turn it into 150 small solar-power satellites, as a proof of concept. ¶ For the woke folks who care about the bloody history of diamond production, there’s the likelihood that space mining would wipe out Earth’s entire diamond industry. “They will be found in quantities unattainable on Earth,” claims Suarez, with good reason. We are starting to discover that there is more crystalized carbon in the cosmos than we ever suspected. Astronomers have identified one [distant planet made entirely of diamond](https://www.nationalgeographic.com/science/phenomena/2014/06/24/diamond-the-size-of-earth/); there may be more, but they are, ironically, hard to see. ¶ We don’t have diamond planets in our solar system (and we can’t do interstellar missions), but we do have diamond-studded asteroids. Mine them for long enough and you will wear diamonds on the soles of your shoes.¶ For investors and entrepreneurs, there is the thrill of racing to be the first member of the four-comma club. ([Neil deGrasse Tyson believes that the first trillionaire will be an asteroid mining mogul](https://www.nbcnews.com/science/space/neil-degrasse-tyson-says-space-ventures-will-spawn-first-trillionaire-n352271); Suarez isn’t sure whether they’ll be the first, but he suspects that asteroid mining “will mint more trillionaires than any industry in history.”) ¶ For the regular guy or gal with a 401K, there’ll be a fast-rising stock market — inflated not by financial shenanigans this time, but an actual increase in what the world counts as wealth.¶ For workers, there is the promise of sharing in the untold riches, both legally and otherwise. It would be hard to stop miners attaining mineral wealth beyond their paycheck, under the table, when your bosses are millions of miles away. Then there’s the likelihood of rapid advancement in this new economy, where the miners fast gain the knowledge necessary to become moguls.¶ “After several tours in space working for others, perhaps on six-month or year-long contracts, it's likely that some workers will partner to set up their own businesses there,” says Suarez. “Either serving the needs of increasing numbers of workers and businesses in space, marketing services to Earth, or launching asteroid mining startups themselves.” All in all, it’s starting to sound a damn sight more beneficial to the human race than the internet economy is. Not a moment too soon. I’ve written encouragingly about asteroid mining several times before, each time touting the massive potential wealth that seems likely to be made. And each time there’s been a sense of disquiet among my readers, a sense that we’re taking our rapacious capitalist ways and exploiting space.¶ Whereas the truth is, this is exactly the version of capitalism humanity has needed all along: the kind where there is no ecosystem to destroy, no marginalized group to make miserable. A safe, dead space where capitalism’s most enthusiastic pioneers can go nuts to their hearts’ content, so long as they clean up their space junk. ¶ ([Space junk](https://mashable.com/category/space-junk) is a real problem in orbital space because it has thousands of vulnerable satellites clustered closely together around our little blue rock. The vast emptiness of cislunar space, not so much.)¶ And because they’re up there making all the wealth on their commodities market, we down here on Earth can certainly afford to focus less on growing our stock market. Maybe even, whisper it low, we can afford a fully functioning social safety net, plus free healthcare and free education for everyone on the planet.¶ It’s also clearly the area where we should have focused space exploration all along. If we settle on Mars, we may disturb as-yet-undiscovered native bacteria — and as the character Nathan Joyce shouts at a group of “Mars-obsessed” entrepreneurs in Delta-V, Mars is basically filled with toxic sand and is thus looking increasingly impossible to colonize. (Sorry, Mark Watney from The Martian, those potatoes would probably kill you.)

#### Warming causes extinction.

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

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

#### An asteroid collision would ensure extinction – would fundamentally alter the biosphere, don’t underestimate its risk. Hudson 19

Wesley Hudson ’19, news reporter for Express, “Asteroid alert: NASA warning as kilometre long space rock set to skim Earth at 25,000mph”, 8/28/19, Express, https://www.express.co.uk/news/science/1170826/asteroid-news-NASA-latest-space-rock-asteroid-1998-HL1-earth-danger-apocalypse

AN ASTEROID almost a kilometre wide is currently barreling through space at more than 25,000mph and is due to skim the earth towards the end of October. NASA’s Jet Propulsion Laboratory (JPL) claim the space rock will shoot past the earth within a “close” proximity of the planet in the early hours of October 26. The asteroid, dubbed 1998 HL1, is a so-called Near-Earth Object (NEO) flying on a Close Approach Trajectory. NASA expects the 1998 HL1 to come flying by dangerously close around 1.21am BST (17.21pm PDT). The daunting moment will mark anther journey around the sun for the asteroid since it was discovered in 1998. The asteroid will be travelling at a staggering speed of over 25,000mph as it barrels past the Earth. The JPL predict the asteroid could be between 440m and 990m wide. At its largest an asteroid of this size is bigger than the tallest building in the world, the Burj Khalifa in Dubai. Even at it’s smallest, 1998 HL1 is still bigger than The Shard. Since it was discovered, 1998 HL1 has been seen up to 408 times. An NEO is an asteroid or comet which is on an orbital path intersecting that of the Earth's. This asteroid will miss the Earth by almost four million miles. If it were to strike the Earth, an asteroid of this size would cause catastrophic damage. The extinction of the dinosaurs in the Cretaceous-Tertiary event 65million years ago is famously believed to have been caused by a massive asteroid impact. The Chicxulub Crater in Mexico is the most commonly accepted point of impact, with the responsible body thought to be around 10km in diameter. A car-sized asteroid is estimated to hit the Earth roughly once a year. The majority of asteroids on track for the planet are usually burnt up as they enter the Earth's atmosphere. NASA administrator Jim Bridenstine has previously warned a potential asteroid collision is more likely then people realise. He said: "We have to make sure that people understand that this is not about Hollywood, it's not about the movies. "This is about ultimately protecting the only planet we know, right now, to host life - and that is the planet Earth.” NASA is currently in the process of developing the Double Asteroid Redirection Test (DART). DART will test if it is possible to redirect asteroids that are threatening to impact with Earth. SpaceX chief Elon Musk had previously tweeted fears of a deadly collision that Earth was not prepared for. Mr Musk tweeted: “A big rock will hit Earth eventually & we currently have no defence.”

#### Don’t write our impacts off as low probability – asteroid collision is complex and the existence of space keyholes exponentially increases the risk of collision. Vereš ’19

Peter Vereš ’19, Harvard-Smithsonian Center for Astrophysics, “Chapter 6 Vision of Perfect Observation Capabilities”, 2019, Planetary Defense, Space and Society, https://dl1.cuni.cz/pluginfile.php/634091/mod\_resource/content/1/Planetary%20Defence.pdf

Often, uncertain orbits are a source of elevated impact risks of some NEOs with the Earth. The impact probability of an asteroid with Earth is a complex problem. First, the orbits of Earth and the asteroid should be close enough or even intersect; second, the Earth and asteroid should meet at the intersection at the same time. If these conditions are met, then one can assess how close the asteroid flies around the Earth at a given time, or whether it will hit the Earth. One must remember that each asteroid orbit comes with uncertainties and therefore, instead of a single accurate solution where the asteroid will hit the Earth or miss it, there is always a realm of possible solutions within the orbit uncertainties. The tangent plane to the asteroid’s trajectory at the time of impact, or close approach, is called a b-plane. At a given time of a predicted impact, all possible closest distances to the Earth of possible orbits create an area on the tangent plane. If the area contains the Earth, then the impact probability for that epoch is non-zero and in a simple approximation can be denoted as a ratio of an area of Earth cross section and the entire area with possible orbits going through the b-plane. It happens that a newly discovered NEO with a short arc that is coming very close to the Earth has a non-zero impact probability, because its orbit is highly uncertain and the area on the b-plane is very large. Typically, further observations improve the orbit, and the impact risk for a given epoch falls to zero. Some objects, however, have orbits with low orbital uncertainty, but still have non-zero impact probability, such as Bennu. The non-zero impact probability is computed for a given time in the future, but even if the orbit is known very well today, small perturbations from planets and non-gravitational forces increase the uncertainty for future impacts. That is why NASA’s Sentry is providing predictions only for the next 100 years. A close flyby of a spacecraft around an asteroid may improve the asteroid’s orbit significantly, however, it does not fully mitigate its impact in the future, due to the presence of keyholes (Chodas 1999)—small areas in space near Earth. Keyholes are specific for asteroids flying very close to the Earth and are rather small, from a few to hundreds of kilometers across. If the keyhole is hit during the NEO flyby, the orbit of the NEO becomes resonant with Earth and the NEO will return to Earth regularly, increasing its impact probability. Thus, in case of a very near Earth flyby, the orbit needs to be known with such precision (~km) that keyhole avoidance is confirmed. NASA has even created the NEO Deflection App,1 where the public can try to change the orbit of a hypothesized NEO on direct impact trajectory. For Earth impact monitoring, the accuracy of orbits and orbital uncertainties is crucial and deserves more attention. The future of orbit determination and uncertainty mitigation will depend more and more on sophisticated software that will be able to handle orbital computation in detail; assess uncertainties and errors of measurements; coordinate a list of objects that are crucial for follow-up or orbit improvement, or even automatically point the telescopes in a network to observe those asteroids; measure their positions; and submit the data to MPC. This automated process is more or less implanted by several surveys (CSS, LCOGT) and agencies (ESA, MPC).

### 5

#### Counterplan: Ukraine should enter into a prior and binding consultation with the International Court of Justice over whether or not to ban the appropriation of outer space by private entities.

#### Advisory opinions from ICJ are necessary to clarify and develop international space law and they say yes

Simpson and Johnson 17 [Michael Simpson, International Space University · Space Policy and Law; Business and Management, Chris Johnson is the Space Law Advisor at the Secure World Foundation, a non-governmental organization (NGO) focused on the sustainable uses of outer space. Christopher does research, writes, and speaks about international and national space law with a special focus on peaceful uses of outer space, emerging governance challenges with non-traditional space activities, and identifying and characterizing deficiencies in existing space law., September 2017, Lacunae and Silence in International Space Law – A Hypothetical Advisory Opinion from the International Court of Justice, ResearchGate, https://www.researchgate.net/publication/320596144\_Lacunae\_and\_Silence\_in\_International\_Space\_Law\_-\_A\_Hypothetical\_Advisory\_Opinion\_from\_the\_International\_Court\_of\_Justice 12-16-2021] rohan

* lacunae = situation where there is no applicable law
* non liquet = no answer from governing system

Since international space law has developed for at least 60 years in an environment devoid of judicial opinions on live controversies, it lacks the judicial contribution to clarification and elaboration of terms and principles normally enjoyed by a body of law. For this reason, advisory opinions may be particularly useful in this area. The mechanism for seizing the Court also appears to be favorably developed. In the nuclear weapons case, the ICJ turned down a 1993 request from the World Meteorological Organization on the grounds that WMO, acting ultra vires lacked standing. Only when the UN General Assembly later made the request in its own name did the Court take up the question.

Since many of the questions amenable to illumination through advisory opinions are within the remit of the UN Committee for the Peaceful Uses of Outer Space (UNCOPUOS), which itself reports through Fourth Committee to the General Assembly, the procedural pathway to a UNGA request is both established and clear. Equally as helpful is that UNCOPUOS operates by consensus. Thus, early requests for clarification, could easily establish that the necessary political will to seek increased clarity was present and permit to begin with less controversial concepts. Once the efficacy of advisory opinions to clarify elements of space law is established, the General Assembly could possibly decide to forward more challenging issues even where consensus in COPUOS could not be expected.

III. NON-LIQUET AT THE ICJ.

It is a general principle of law at both the national and international level (indeed inherited from ancient Roman law) that when asked to deliver a judgement, a court knows the law (Iura novit curia). So it should seem as an unexpected and rare surprise when a court does not, indeed, know the law. In the Nuclear Weapons advisory opinion, the Court considered the existing law applicable to the threat or use of nuclear weapons, and their treatment under the various sources and bodies of law. The Court was asked to consider “is the threat or use of nuclear weapons in any circumstances permitted under international law?” However, the Court slightly rephrased that question merely to “determine the legality or illegality of the threat or use of nuclear weapons.”11 In seeking an answer, the Court looked to custom and to treaties, and looking to a diverse field of special regimes of international law, including the law of armed conflict (LOAC) a.k.a. International Humanitarian Law (IHL) (including jus ad bellum and jus in bellow), environmental law, and human rights law. However, the law, as a system and as a whole, was weighed and found wanting. The Court concluded:

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Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports (1996) p. 226, 238 para.

97. Accordingly, in view of the present state of international law viewed as a whole, as examined above by the Court, and of the elements of fact at its disposal, the Court is led to observe that it cannot reach a definitive conclusion as to the legality or illegality of the use of nuclear weapons by a State in such circumstance of self-defense, in which its very survival would be at stake.

Non liquet, meaning, it is not clear, is where a court finds the law insufficient, and does not permit a conclusion one way or the other regarding the issue it is presented with.

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IV. SPACE LAW, LACUNAE, AND NON-LIQUET

The idea that gaps in the law or uncertainty with its provisions can render judicial decisions impossible, difficult, or unwise is at least as old as Roman law. As such the concepts of lacunae and non liquet still bear the Latin names that would have been familiar to lawyers and legal scholars throughout the Roman Empire. As explained by Mark Bogdansky, non liquet can be extended to cover both the case where no legal rule can be found that applies to a case under consideration and to the case where lack of clarity in the facts or in a principle of law makes it impossible to discern clearly the implications of that principle in light of the facts presented. Bogdansky refers to the former situation as ontological non liquet and to the latter as epistemological. We will use lacunae to refer to apparent gaps in international space law and will confine our use of “non liquet” to situations where a principle has been articulated but is not clear.

Definitions become extremely important in discussing the impact of lacunae and non liquet on international space law. Note for example the list of lacunae in José Monserrat Filho’s excellent paper, “Space Law In The Light Of Bobbio's Theory Of Legal Ordering,” IAC-12.E7. 5. 6.

1. Definition of “space object”, “space debris”, “space activities”, “space launching”;

2. Binding “Space Debris Mitigation Guidelines”;

3. Prohibition of all kind of weapons in Earth orbits;

4. Definition and delimitation of the outer space;

5. Regulation of commercialization of space activities;

6. Environmental damage in Liability Convention;

7. Industrial exploitation of lunar natural resources;

8. Remote sensing activities in the XXI century;

9. Satellite data as evidence in criminal proceedings;

10. The use of nuclear power sources in space;

11. The human presence in space.

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While items 2, 3, 6, and 11 fit clearly into our definition of lacunae, the others represent cases where legal principles have been articulated, but are subject to substantial disagreement as to their application to various fact situations. Where lacunae exist, the utility of advisory opinions is greatly constrained. The foundational principles of positivism and sovereignty that are key pillars of international law do not lend themselves to judicial activism in creating legal rules in the absence of political action to create them. On the other hand, where a situation of non liquet emerges from disagreement over definitions or the application of a legal principle to a particular situation, an advisory opinion could have either one of two beneficial outcomes.

In the first case an advisory opinion could clarify the meaning of terms where uncertainty exists. This situation would require strong arguments to support the opinion and justify it. It might be elaborated on the basis of original intent reflected in the travaux préparatoires, clear patterns of application of terms and principles in the action of States parties to the agreements where uncertainty exists or lack of clarity is perceived, or lucid reasoning by analogy to similar situations where greater certainty can be demonstrated.

The second case could result from an opinion that clarification cannot be provided and that the matter remains non liquet. In this case, there would be an unambiguous signal that political/ diplomatic action would be required to clarify the issues in dispute. Take for example the hypothetical example of a case seeking clarification of the non-appropriation clause of the Outer Space Treaty. A non liquet in such a case would leave those wishing to assert that a prohibition against off Earth mining existed in international law without a legal vindication of their position while those wishing to engage in such mining would face uncertainty because the Court had not ruled definitively that non appropriation did not apply to them. Since the mining advocates would be ~~handicapped~~ by uncertainty in their approaches to potential investors, both sides would have an incentive to seek a political resolution with the compromises that was likely to entail.

#### International space legal regime are needed to solve space war --- malleable laws are key in outer space

Hart 21 [Amalyah Hart, Amalyah Hart is a science journalist based in Melbourne, 11-19-2021, "Do we need new space law to prevent space war", Cosmos Magazine, https://cosmosmagazine.com/people/society/space-law-to-prevent-space-war/] simha

The week before last, a UN panel approved the creation of a working group to discuss next-generation laws to prevent the militarisation of space. The move comes as space 2.0 seems to be going into hyper-drive, with countries and corporations racing to claim their stake in the final frontier. It’s timely, as the potential for friction is gathering by the day, with China, India, Russia and the US testing anti-satellite missiles on their own satellites and creating worrisome clouds of debris. This week’s destruction by Russia of its “dead” satellite, Cosmos 1408, underlined the issue. Meanwhile, the orbital space around Earth is becoming jammed with machinery; currently, there are 3,372 active satellites whizzing around Earth, but in one or two decades that number is set to leap to potentially 100,000 or more. And that’s ignoring the space stations, telescopes and spyware already in orbit as countries flex their aerospace muscles. It’s a cosmic fracas. And contested territory is prime fodder for international disputes, as we know. It’s these kinds of disputes the group of UK diplomats who proposed the UN motion want to prevent, by coming to an agreed-upon set of norms for behaviour in space. Space law: what are the issues at stake? The current international framework for law in space is the UN’s 1967 Outer Space Treaty (OST), which sets governing principles for the exploration of space, including that space should be free for use by all nations, that celestial bodies like the Moon should be used exclusively for peaceful purposes, and that outer space should not be subject to national appropriation. Under international law, any and all objects being launched into space must be registered to avoid collisions. On top of these global laws, each nation-state has its own legal framework around the registering and launching of objects into space. But as technology evolves and new opportunities arise, are these old laws equipped to govern new problems? The UN’s 1967 Outer Space Treaty sets governing principles for the exploration of space, including that space should be free for use by all nations. “There exists an incredible amount of applicable law already, and it has served us really well,” says space law expert Steven Freeland, an emeritus professor at Western Sydney University and professorial fellow at Bond University. Freeland is vice-chair of a UN Committee on the Peaceful Uses of Outer Space (COPUOS) working group that is developing laws around the exploitation of resources in space. “There’s a lot of law at the multilateral level that then filters down to other layers of bilateral or ‘minilateral’ agreements and national laws. But clearly things move so quickly with technology, we’re doing so many more things in space that were beyond the contemplation of the drafters of the original treaties. Ideally we need more.” Freeland says there are myriad complex, interconnected issues in space that need tighter laws. These include the increasing militarisation of space; the proliferation of satellites, which can lead to overcrowding of “popular” orbits and increased demand for radio-wave spectra; ethical issues around human spaceflight; and the possible extraction of resources on celestial bodies like the Moon. Resource exploitation It might sound like science fiction, but mining in outer space is looking increasingly likely in the not-too-distant future. In September 2020, NASA announced that it would award contracts to private companies for the extraction and purchase of lunar regolith (rock matter) from the surface of the Moon, which could be mined and then studied in situ by the company, before the data and rights are transferred to the space agency. The move heralds what our space-based future might look like, with private companies mining celestial bodies for their precious resources. In our solar system, composed of millions of celestial bodies both large and small, the opportunities for cashing in look potentially endless – provided technology advances to the level of practical spaceflight. “Most wars on Earth have historically been fought over a quest for resources,” says Freeland, “so it’s incredibly important [to have appropriate space laws].” Just last month, scientists announced the discovery of two extraordinarily metal-rich near-Earth asteroids (NEAs), comprised of roughly 85% metals like iron, nickel and cobalt, which are thought to exceed Earth’s entire known metallic reserves. These three highly valuable metals, often known as the “iron triad”, are particularly critical for the energy supply chain and a renewable energy future; they’re used to build lithium-ion batteries, electrochemical capacitators for storing energy, and nano-catalysts for use in the energy sector. Under the OST, outer-space resources cannot be appropriated by nations, but the law and principle around the commercial use of space resources is less clear. The 1979 Moon Treaty holds that any celestial body is under the jurisdiction of the international community and therefore subject to international law. The treaty outlaws the military use of any celestial body as well as providing a legal framing for the “responsible” exploitation of celestial resources. But, to date, no space-capable nation has ratified the treaty. Militarisation That brings us to the militarisation of space. As technology advances, the potential avenues for weapons that cross the border from terrestrial to cosmic continue to proliferate. So, what laws protect us from a space war? “The issues about security in space have historically been dealt with by the CD, the Conference of Disarmament, but more recently the UK has led discussions at the United Nations that effectively seek to change the diplomatic language and thinking about space security,” says Freeland. Currently, the principles for governing space under the OST forbid the military use of space, but space is already used for military purposes such as surveillance, and some missiles carve a path through outer space on their journeys to their targets. As it currently stands, the only weapons found in space are the TP-82 Cosmonaut survival pistols that Russian astronauts regularly take on board the Soyuz spacecraft, intended to protect them from a potential wild animal attack if they are forced to emergency land in “off-the-map” territory. But as technology proliferates, the opportunities for space-based militarisation also grow. The existing laws were drafted long before many of these technologies were even dreamed up. The most worrisome technologies currently being trialled are anti-satellite missiles. “We have this strategic competition going on amongst the major powers,” says Gilles Doucet, a space security consultant based in Canada who worked for 35 years with the Canadian Department of National Defence. Doucet is both an engineer and an expert in space law. “They all wish to be dominant and make sure that their national security is secured by controlling, or at least not having other people control, outer space.” But what kinds of defence technologies are being developed in space? Doucet says the most worrisome technologies currently being trialled are anti-satellite missiles of the sort that Russia deployed earlier this week. Known as direct-ascent anti-satellite missiles (DA-ASAT), they can destroy satellites in low Earth orbit. “This essentially looks a lot like ballistic missile defence, but it’s happening in outer space against satellites,” he says. In fact, DA-ASAT technology is dependent on the same technology used for midcourse ballistic missile defence – the technology that the US, for example, deploys to defend itself from potential ballistic missile attacks on North America. These missiles fly at altitudes of around 3,000 to 4,000 kilometres, well within the low-Earth orbit many satellites operate in. This technology is being developed and tested by the US, China, India and Russia. “Destroying another country’s satellites would only occur in an armed conflict scenario,” Doucet says. “It would be because the other country’s satellite is providing an important military role – for example, a GPS satellite for directing munitions or an imagery satellite for locating your forces.” Other military applications in space, Doucet says, include the jamming of satellite communications and navigation, as well as interference with some GNSS signals, of which GPS – the satellite navigation system we all use for things like Google Maps – is one. Satellite jamming can have major disruptive potential. “You might be conducting an operation in a conflict – let’s say you wish to target a certain facility. Your missile system or your drone-launching missiles rely on GPS to guide them,” Doucet says. “So if you’re on the other end of it wanting to protect yourself, then you’ll send out jamming signals.” But while these signals can help defend a military target, Doucet says many satellites provide services for military and civilian companies and organisations at once. In this case, jamming a satellite’s signal may also interfere with civilian services it provides, including aircraft and ship navigation, car mapping, even timing signals for financial transactions. This means satellite jamming has major disruptive potential. And there are other areas where satellite technology could have duplicitous or combative potential. “Close proximity operations seem to get countries a bit upset,” says Doucet. Close proximity operations, as the name suggests, involve satellites moving close to other satellites. “One reason might be intelligence or inspection, just to take close images to understand how it’s built. But you may be getting close to intercept signals or to interfere with signals. “So that is a concern, because it’s one thing to get close for passively collecting information, but if you’re close you may also be in a position to interfere.” What might new space law systems look like? “We have a lot of space systems that are dual use, that have the potential to do harm,” Doucet says. “I’d like to see some transparency on the mission, on what you’re doing, to help alleviate concerns. “That might sound like a small step, but to militaries it’s actually a really big step to provide transparency.” Doucet says he’d also like to see clarification of the existing principles for space law already set out in the OST and other treaties. In fact, he’s currently working on the MILAMOS Project, developing a Manual on International Law Applicable to Military Uses of Outer Space at Canada’s McGill University. “I would like to see the existing legal regime being given a bit of life,” he says. “We’ve got tremendously good outer space principles, but over several decades countries have kind of refused to give them life because it’s too controversial. “The third thing I’d like to see is the major space powers sit down and talk. They’re all potentially losers if this keeps going down this path. I don’t think there’s a winner in a space war.” For all these complex problems, Doucet is cautiously optimistic about our chances of avoiding a space war. “I don’t think the issue about space security is as unique as people think,” he says. “Yes, it’s a very unique domain, but the actors are all the same, the interests are all the same. It’s the same people that have struggled over ballistic missile proliferation, nuclear weapons proliferation, treaties about the high seas, about aviation and all kinds of things. “So, we shouldn’t think this is an unsolvable problem. We may take lessons from how we’ve managed to agree to disagree in other areas beyond national jurisdiction.” Freeland agrees that even if international tensions may simmer at home, it’s in the best interest of major global powers to come to agreements about laws in space. “When it comes to these really big issues, particularly issues that have the propensity to go horribly wrong if we follow an irresponsible path, in the end it’s in [governments’] common interest to agree to the rules of the road,” he says. “The important element is that they have had the opportunity to buy in on the framing of those rules.“I think we need to be optimistic. With a great deal of caution, cool heads will prevail.”

# CASE

#### No solvency – ballistic missiles don’t go to space. None of their evidence is about the space industry

#### Alt causes thump the first scenario – Marlborough reads yellow.

Fuhrman 6/30 [(Eli, a contributing writer for The National Interest.) “Ukraine Gave Up Its Nukes — And Some of Its Secrets to North Korea” National Interest, 6/30/2021. https://nationalinterest.org/blog/korea-watch/ukraine-gave-its-nukes-%E2%80%94-and-some-its-secrets-north-korea-188945] BC

North Korea’s ability to make such substantial progress in the development of its ballistic missile capabilities – particularly with regards to its long-range missiles – is likely the result of a number of factors, including simply the progress that can be expected to emerge from sustained and dedicated efforts. Since coming to power in 2011, North Korean leader Kim Jong Un has presided over a significant increase in North Korean ballistic missile tests. This increased effort has borne fruit, producing breakthroughs that have themselves resulted in additional breakthroughs; North Korea’s development of its Hwasong-12 intermediate-range ballistic missile (IRBM) that is capable of hitting the island of Guam, for example, proved to be the foundation upon which the Hwasong-14 was built.

But North Korea’s progress in the development of its ballistic missiles has also most assuredly been the result of new technology becoming available to the DPRK, and one important source of this technology has likely been Ukraine.

Scientists have been a favorable group within North Korea for much of the country’s existence, and Kim Il Sung is believed to have sent North Korean scientists to study in various parts of the Soviet Union and the socialist world, which may well have included Ukraine. The country is also believed to have attempted to recruit suddenly out of work Soviet scientists and missile engineers after the collapse of the Soviet Union, which is again likely to have included efforts to woo Ukrainian experts.

But scientific exchanges and rogue scientists and engineers likely do not form the entirety – or even the most important aspect – of the connection between Ukraine and the North Korean ballistic missile program. Instead, the more significant connection likely revolves around a particular rocket factory near the Ukrainian city of Dnipro known as Yuzhmash. The factory was once a major production site for advanced Soviet ballistic missiles, but has now shifted its focus to the production of such things as rockets designed to launch satellites into space; the site did, however, remain a common storage site for space ballistic missile components, including engines.

North Korea has for many years had an interest in the site, with one former employee of the factory recalling a tour he gave to North Koreans posing as tourists in the early 2000s. They were almost certainly not tourists, however, and the United Nations Panel of Experts has confirmed that in 2011-2012 North Korean operatives attempted to steal missile designs from the factory before they were apprehended by the Ukrainian Security Services.

Despite the failure of that operation, North Korea does appear to have successfully acquired Soviet missile technology that has proven essential in the development of its own ballistic missile capabilities. Analysis of the Hwasong-14 has revealed that the missile looks to be powered by several Soviet RD-250 engines, which may have come from the Yuzhmash facility. It is not entirely clear how North Korea acquired the engines though the most likely explanation involves a DPRK black market purchase.

Regardless, the connection between Ukraine and the North Korean ballistic missile program reveals both how North Korea was able to so quickly advance its long-range missile capabilities and the lengths to which the country will go in order to do so, as well as the degree of difficulty associated with preventing advances in North Korea’s missile program.

#### No space war and terrestrial conflict turns it

Luke Penn-Hall 15, Analyst at The Cipher Brief, M.A. from the Johns Hopkins School for Advanced International Studies, B.A. in International Relations and Religious Studies from Claremont McKenna College, “5 Reasons “Space War” Isn’t As Scary As It Sounds”, The Cipher Brief, 8/18/2015, https://www.thecipherbrief.com/article/5-reasons-%E2%80%9Cspace-war%E2%80%9D-isn%E2%80%99t-scary-it-sounds

The U.S. depends heavily on military and commercial satellites. If a less satellite-dependent opponent launched an anti-satellite (ASAT) attack, it would have far greater impact on the U.S. than the attacker. However, it’s not as simple as that – for the following reasons: 1. An ASAT attack would likely be part of a larger, terrestrial attack. An attack on space assets would be no different than an attack on territory or other assets on earth. This means that no space war would stay limited to space. An ASAT campaign would be part of a larger conventional military conflict that would play out on earth. 2. Every country with ASAT capabilities also needs satellites. While the United States is the most dependent on military satellites, most other countries need satellites to participate in the global economy. All countries that have the technical ability to play in this space – the U.S., Russia, China and India - also have a vested interest in preventing the militarization of space and protecting their own satellites. If any of those countries were to attack U.S. satellites, it would likely hurt them far more than it would hurt the United States. 3. Destruction of satellites could create a damaging chain reaction. Scientists warn that the violent destruction of satellites could result in an effect called an ablation cascade. High-velocity debris from a destroyed satellite could crash into other satellites and create more high-velocity debris. If an ablation cascade were to occur, it could render certain orbital levels completely unusable for centuries. 4. Any country that threatened access to space would threaten the global economy. Even if a full-blown ablation cascade didn’t occur, an ASAT campaign would cause debris, making operating in space more hazardous. The global economy relies on satellites and any disruption of operations would be met with worldwide disapproval and severe economic ramifications. 5. International Prohibits the Use of ASAT Weapons. Several international treaties expressly prohibit signatory nations from attacking other countries’ space assets. It is generally accepted that space should be treated as a global common area, rather than a military domain. While it remains necessary for military planners to create contingency plans for a, space war it is a highly unlikely scenario. All involved parties are incentivized against attacking. However, if a space war did occur, it would be part of a larger conflict on Earth. Those concerned about the potential for war in space should be more concerned about the potential for war, period.

#### No Russia escalation or miscalc

Simon Saradzhyan 19, MPA from Harvard University, Founding Director of Russia Matters, Assistant Director of the U.S.-Russia Initiative to Prevent Nuclear Terrorism at the Belfer Center for Science and International Affairs, “How High Is Risk of Nuclear War Between Russia and US?”, Russia Matters – Blog of the Belfer Center for Science and International Affairs at Harvard University, 8/6/2019, https://www.russiamatters.org/blog/how-high-risk-nuclear-war-between-russia-and-us

The scenario Moniz and Nunn outline is not without contestable points. For instance, even if Russia’s early warning system—which includes not only over-the-horizon Daryal and Voronezh radar systems, but also satellites—issues a false alert due to a cyber-attack, Russia’s S-400 and other air defense systems’ radars would remain functioning. These radars, which operate independently of Russia’s System of Warning of Missile Attack (SPRN), are capable of detecting targets up to 600 kilometers away, which would enable their crews to verify if an air attack is evolving east of Berlin or Warsaw. As important, neither of the scenarios for use of nuclear weapons, which are described in Russia’s current military doctrine, align with Moniz’s and Nunn’s scenario. The 2014 document states that “the Russian Federation shall reserve the right to use nuclear weapons” in two scenarios (or a combination of the two). One is “in response to the use of nuclear and other types of weapons of mass destruction against it and/or its allies.” The other is “the event of aggression against the Russian Federation with the use of conventional weapons when the very existence of the state is in jeopardy.” The scenario Moniz and Nunn describe does not feature use of weapons of mass destruction by NATO against Russia or its allies, nor can NATO air strikes on the Kaliningrad exclave, located more than 900 kilometers away from Moscow, qualify as a situation that jeopardizes the very existence of the Russian state. In fact, the authors themselves point out that the proposition that Russia plans to use nukes for purposes of “escalating to de-escalate” is “often denied by Russian officials and academics.” Russian experts are not the only ones who are skeptical of the de-escalation proposition. For instance, Dr. Olga Oliker, one of America’s leading experts on Russian nuclear posture, has presented evidence showing why Russia’s so-called de-escalation strategy is likely a “non-existent problem.” Also, if we were to define risk as a combination of probability and consequences, then the latter would have been graver in the 1980s, when the combined number of U.S. and Russian nuclear weapons peaked, according to the Federation of American Scientists.

#### No miscalc or escalation

James Pavur 19, Professor of Computer Science Department of Computer Science at Oxford University and Ivan Martinovic, DPhil Researcher Cybersecurity Centre for Doctoral Training at Oxford University, “The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space”, 2019 11th International Conference on Cyber Conflict: Silent Battle T. Minárik, S. Alatalu, S. Biondi, M. Signoretti, I. Tolga, G. Visky (Eds.), <https://ccdcoe.org/uploads/2019/06/Art_12_The-Cyber-ASAT.pdf>

A. Limited Accessibility Space is difficult. Over 60 years have passed since the first Sputnik launch and only nine countries (ten including the EU) have orbital launch capabilities. Moreover, a launch programme alone does not guarantee the resources and precision required to operate a meaningful ASAT capability. Given this, one possible reason why space wars have not broken out is simply because only the US has ever had the ability to fight one [21, p. 402], [22, pp. 419–420]. Although launch technology may become cheaper and easier, it is unclear to what extent these advances will be distributed among presently non-spacefaring nations. Limited access to orbit necessarily reduces the scenarios which could plausibly escalate to ASAT usage. Only major conflicts between the handful of states with ‘space club’ membership could be considered possible flashpoints. Even then, the fragility of an attacker’s own space assets creates de-escalatory pressures due to the deterrent effect of retaliation. Since the earliest days of the space race, dominant powers have recognized this dynamic and demonstrated an inclination towards de-escalatory space strategies [23]. B. Attributable Norms There also exists a long-standing normative framework favouring the peaceful use of space. The effectiveness of this regime, centred around the Outer Space Treaty (OST), is highly contentious and many have pointed out its serious legal and political shortcomings [24]–[26]. Nevertheless, this status quo framework has somehow supported over six decades of relative peace in orbit. Over these six decades, norms have become deeply ingrained into the way states describe and perceive space weaponization. This de facto codification was dramatically demonstrated in 2005 when the US found itself on the short end of a 160-1 UN vote after opposing a non-binding resolution on space weaponization. Although states have occasionally pushed the boundaries of these norms, this has typically occurred through incremental legal re-interpretation rather than outright opposition [27]. Even the most notable incidents, such as the 2007-2008 US and Chinese ASAT demonstrations, were couched in rhetoric from both the norm violators and defenders, depicting space as a peaceful global commons [27, p. 56]. Altogether, this suggests that states perceive real costs to breaking this normative tradition and may even moderate their behaviours accordingly. One further factor supporting this norms regime is the high degree of attributability surrounding ASAT weapons. For kinetic ASAT technology, plausible deniability and stealth are essentially impossible. The literally explosive act of launching a rocket cannot evade detection and, if used offensively, retaliation. This imposes high diplomatic costs on ASAT usage and testing, particularly during peacetime. C. Environmental Interdependence A third stabilizing force relates to the orbital debris consequences of ASATs. China’s 2007 ASAT demonstration was the largest debris-generating event in history, as the targeted satellite dissipated into thousands of dangerous debris particles [28, p. 4]. Since debris particles are indiscriminate and unpredictable, they often threaten the attacker’s own space assets [22, p. 420]. This is compounded by Kessler syndrome, a phenomenon whereby orbital debris ‘breeds’ as large pieces of debris collide and disintegrate. As space debris remains in orbit for hundreds of years, the cascade effect of an ASAT attack can constrain the attacker’s long-term use of space [29, pp. 295– 296]. Any state with kinetic ASAT capabilities will likely also operate satellites of its own, and they are necessarily exposed to this collateral damage threat. Space debris thus acts as a strong strategic deterrent to ASAT usage.

#### MAD checks space escalation – nuclear response and debris

Bowen 18 [Bleddyn Bowen, Lecturer in International Relations at the University of Leicester. The Art of Space Deterrence. February 20, 2018. https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/]

Fourth, the ubiquity of space infrastructure and the fragility of the space environment may create a degree of existential deterrence. As space is so useful to modern economies and military forces, a large-scale disruption of space infrastructure may be so intuitively escalatory to decision-makers that there may be a natural caution against a wholesale assault on a state’s entire space capabilities because the consequences of doing so approach the mentalities of total war, or nuclear responses if a society begins tearing itself apart because of the collapse of optimised energy grids and just-in-time supply chains. In addition, the problem of space debris and the political-legal hurdles to conducting debris clean-up operations mean that even a handful of explosive events in space can render a region of Earth orbit unusable for everyone. This could caution a country like China from excessive kinetic intercept missions because its own military and economy is increasingly reliant on outer space, but perhaps not a country like North Korea which does not rely on space. The usefulness, sensitivity, and fragility of space may have some existential deterrent effect. China’s catastrophic anti-satellite weapons test in 2007 is a valuable lesson for all on the potentially devastating effect of kinetic warfare in orbit.

#### No one’s going to war over a downed satellite

Bowen 18 [Bleddyn Bowen, Lecturer in International Relations at the University of Leicester. The Art of Space Deterrence. February 20, 2018. https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/]

Space is often an afterthought or a miscellaneous ancillary in the grand strategic views of top-level decision-makers. A president may not care that one satellite may be lost or go dark; it may cause panic and Twitter-based hysteria for the space community, of course. But the terrestrial context and consequences, as well as the political stakes and symbolism of any exchange of hostilities in space matters more. The political and media dimension can magnify or minimise the perceived consequences of losing specific satellites out of all proportion to their actual strategic effect.