# 1

#### Interp: The affirmative must disclose the plan text if they break new when pairings are released if the debate is flight one

Violation: They didn’t

Graphical user interface, text, application, email

Description automatically generated

#### Predictability – having no idea what the debate will be about makes being neg impossible – the aff gets plan text choice and infinite prep to craft the most strategic case. No disclosure makes this impossible to overcome b/c it means the neg only gets 4 mins of prep to answer a strategy that the AFF had 2 months to prep esp on a topic with dozens of actors and infinite mechanisms – Fairness must be intrinsic to debate because otherwise no one would participate

#### Clash – predictability controls the internal link to clash because it determines how the neg engages – k2 substantive engagement and advocacy skills

#### Core topic education – plan text disclosure discourages cheap shot aff’s. If the aff isn’t inherent or easily defeated by 20 minutes of research, the case should lose. In their model bad AFF’s can win on purely surprise factor which creates a race to the margins of the topic – kills topic education which outweighs because it’s the only impact unique to LD

Competing interps since reasonability invites arbitrary judge intervention based on preference rather than argumentation and encourages a race to the bottom in which debaters exploit a judge’s tolerance for questionable argumentation.

No RVIs: Causes substance crowdout, illogical because fairness is an aff burden, and causes intentionally cheaty affs to bait theory

# 2

#### Interpretation: “Appropriation of outer space” is exclusive and permanent

TIMOTHY JUSTIN TRAPP, JD Candidate @ UIUC Law, ’13 quoting Smith 92, TAKING UP SPACE BY ANY OTHER MEANS: COMING TO TERMS WITH THE NONAPPROPRIATION ARTICLE OF THE OUTER SPACE TREATY UNIVERSITY OF ILLINOIS LAW REVIEW [Vol. 2013 No. 4]

The issues presented in relation to the nonappropriation article of the Outer Space Treaty should be clear.214 The ITU has, quite blatantly, created something akin to “property interests in outer space.”215 It allows nations to exclude others from their orbital slots, even when the nation is not currently using that slot.216 This is directly in line with at least one definition of outer-space appropriation.217 [\*\*Start Footnote 217\*\*Id. at 236 (“Appropriation of outer space, therefore, is ‘the exercise of exclusive control or exclusive use’ with a sense of permanence, which limits other nations’ access to it.”) (quoting Milton L. Smith, The Role of the ITU in the Development of Space Law, 17 ANNALS AIR & SPACE L. 157, 165 (1992)). \*\*End Footnote 217\*\*]The ITU even allows nations with unused slots to devise them to other entities, creating a market for the property rights set up by this regulation.218 In some aspects, this seems to effect exactly what those signatory nations of the Bogotá Declaration were trying to accomplish, albeit through different means.219

#### Violation – satellites aren’t appropriation – its not a permanent exercise of control over a given physical area

#### Limits – they include anything that occupies space, which means there’s a new aff for every one of the 7500 orbiting satellites – tanks neg prep

#### Ground – disproportionate literature on individual satellites means their model structurally favors the aff – assume the worst case scenario

Competing interps – reasonability is arbitrary and c/I is k2 the best model

# 3

#### Bipartisan anti-china momentum ensures COMPETES passes now and maintains tech leadership, but its narrow

Sayers & Kanapathy 2/15 [ Eric Sayers, a senior vice president at Beacon Global Strategies, and Ivan, a vice president at Beacon Global Strategies, both guest contributors for Foreign Policy magazine “America is Showering China with New Restrctions” https://foreignpolicy.com/2022/02/15/us-china-economic-financial-decoupling-controls-restrictions-sanctions/]

In recent years, Washington’s China policies have expanded rapidly into technology sectors such as telecommunications, semiconductors, data security, and financial services. Growing bipartisan concern about Beijing’s actions and intentions have fueled these developments, with little difference between the Trump and Biden administrations or between the White House and Congress. The result has been a flurry of new restrictions—including on exports, imports, direct investment, and financial securities—that are fundamentally reshaping the U.S.-China economic relationship. Cross-border business travel between the United States and China, essentially halted for the past two years due to the COVID-19 pandemic, is unlikely to fully rebound because of increased caution and suspicion on both sides of the Pacific. At the same time as this more defensive approach to economic and technology competition with China has taken root, Congress has also gone on the offensive by moving to appropriate new funding to areas deemed critical to maintaining U.S. competitive advantages in technology, manufacturing, and defense. The current depth and breadth of these approaches were hard to imagine just a few years ago. The corporate sector, besides facing increased government action with respect to doing business with China, must also contend with shifting public opinion and increased investor scrutiny—for example, on human rights issues along companies’ supply lines in China. Looking ahead, 2022 promises a continuation of these trends, which will have far-reaching impacts across multiple business sectors. In just the last three years, Washington has enacted a raft of policy changes and regulation related to economic competition with China. In early 2018, the Trump administration applied and expanded tariffs on Chinese goods in response to Beijing’s unfair practices, including industrial subsidies, forced technology transfer, and state-sponsored intellectual property theft. Leveraging new laws passed in 2018, Washington expanded the use of export controls in defense technology, imposed stricter vetting of foreign investments in strategic U.S. industries, and restricted the procurement of equipment and services from five Chinese information technology companies, the most prominent of which was Huawei. The pace and scope of Washington’s policymaking have accelerated in ways not previously considered possible. In addition, U.S. border agencies shifted their sights from primarily countering terrorists to screening for nontraditional intelligence collectors—for example, journalists, researchers, and businesspeople, who are frequently used by Beijing to gather information—as well as counterfeit goods and goods produced with forced labor. Using presidential emergency powers, the Trump administration also created regimes to remove untrusted contractors from U.S. IT infrastructure projects and block Americans from investing in companies that work with the Chinese military. To Beijing’s consternation, the Biden administration has signaled its general agreement with all these approaches—and even expanded the investment ban to include Chinese surveillance technology companies. While close U.S. allies in Europe and Asia have been reluctant to impose a similarly broad sweep of policies, the Biden administration has achieved significant rhetorical alignment on defining the challenges posed by Beijing. Under pressure from the Trump administration, several U.S. allies turned away from Huawei, blocked inbound Chinese technology investments, and held up the shipment of critical semiconductor manufacturing equipment to China. However, Europe has yet to follow the United States in imposing real costs on China for its ongoing human rights violations, even though this is a declared point of convergence between the United States and the European Union. For its part, Congress has passed a slew of China-related bills. Among other actions, legislators have reformed inbound investment screening, forced the delisting of Chinese stocks that do not comply with U.S. accounting practices, expanded requirements for the U.S. Defense Department to list Chinese companies assisting the People’s Liberation Army, strengthened sanctions authorities in response to atrocities in Xinjiang and repression in Hong Kong, presumed that all goods produced in Xinjiang are made with forced labor (and thus banned as imports), and prohibited the federal purchase of Chinese telecommunications equipment. While Washington mainly focused on defensive measures in recent years, Congress began in 2020 to balance its approach with a more offensive agenda. Efforts to invest in semiconductor manufacturing, accelerate the adoption of 5G telecommunications capabilities, and reorganize the National Science Foundation to focus on increasing U.S competitiveness were all added to the Senate’s U.S. Innovation and Competition Act. The House of Representatives, in turn, recently passed a similar bill—the America COMPETES Act of 2022—so the prospects for final passage of a bipartisan competitiveness bill sometime this spring look strong.This flurry of activity raises the question of what comes next. Looming issues such as rising inflation, possible new variants of COVID-19, and Russian aggression toward Ukraine could take Washington’s attention away from China policy, at least temporarily. At the same time, there is a strong bipartisan consensus—between the White House and Congress—on China. In particular, there are five policy areas where further action appears imminent this year.

#### Space policy causes immense partisan backlash that wrecks the delicate balance

Dreier 16 [Casey Dreier, Chief Advocate & Senior Space Policy Adviser for The Planetary Society, April 13, 2016. “Does Presidential Intervention Undermine Consensus for NASA?” https://www.planetary.org/blogs/casey-dreier/2016/0413-does-a-strong-president-help-or-hurt-consensus-on-NASA.html]

To see how this happens, I recommend reading the book “[Beyond Ideology](http://smile.amazon.com/Beyond-Ideology-Politics-Principles-Partisanship/dp/0226470768/ref=smi_www_rco2_go_smi_g2243582042?_encoding=UTF8&*Version*=1&*entries*=0&ie=UTF8)” by Frances Lee. The author’s larger premise is that issues having no intrinsic relation to stated party ideology have become increasingly polarized in recent years. This is a function of the two party nature of our political system. If your party coalition wins, the other one loses. It’s [It is] zero-sum. Your party can win in one of two ways: you can make a better pitch to voters by demonstrating the superiority of your agenda; or you can undermine and stymie the agenda of the opposition party, making them unpopular with voters, and pick up the seats that they lose. Since you’re the only other political party, you gain in either scenario. I’m not sure if you’ve noticed, but the “undermine and stymie” approach has been popular for quite some time now in the U.S. Congress. Given this situation, the President and their policies naturally become the symbolic target of the opposition party. Anything promoted by the President effectively induces opposition by association. Lee demonstrates the magnitude of this induced polarization on various types of issues. For highly polarized issues like the role of government in the economy, or social issues, the impact is minimal—the opposition has already been clearly defined and generally falls into clearly defined ideologies of the Republican and Democratic parties. But for issues that do not fit readily into a predefined political ideology—like space—the induced polarization by the President can be significant. In fact, Lee showed that space, science, and technology issues incur the greatest increase in partisanship based on their inclusion in the Presidential agenda. One need only look to at the responses by political operatives of the opposing party to the strong human spaceflight proposals by [Barack Obama in 2010](http://www.shelby.senate.gov/public/index.cfm/mobile/newsreleases?ID=25F3AD2E-802A-23AD-4960-F512B9E205D2), [George W. Bush in 2004](http://www.nbcnews.com/id/3950099/ns/technology_and_science-space/t/bush-sets-new-course-moon-beyond/#.Vw3UMRMrKHo), and [George H.W. Bush in 1989](http://www.nytimes.com/1989/07/21/us/president-calls-for-mars-mission-and-a-moon-base.html) to see this reflected in recent history. This isn’t to say that Presidents can’t have a significant impact on the space program. Clearly they can. But the broad consensus needed for stability after their departure from office may be undermined by the very priority they gave it during their tenure. It what amounts to a mixed blessing for NASA, the U.S. space program does have an unusually strong bipartisan group of politicians who support the program due to NASA centers in a variety of states throughout the union. Berger notes this throughout his article, and it does, in a way, act as force that is resistant to change for good and bad. This mitigates somewhat the pure polarization seen on other science and technology issues. But for a Journey to Mars—a major effort that would, at best, require stability and significant funding over many Presidential administrations—that may not be enough. Perhaps the solution is for the next President to maintain a light touch on space. Maybe they should speak softly through the budget process, and avoid the Kennedyesque speeches and declarations to Congress that induce the types of partisanship we so dearly need to avoid.

#### Chinese tech leadership causes nuke war

Kroenig & Gopalaswamy 18, \*Associate Professor of Government and Foreign Service at Georgetown University and Deputy Director for Strategy in the Scowcroft Center for Strategy and Security at the Atlantic Council. \*\*Director of the South Asia Center at the Atlantic Council. He holds a PhD in mechanical engineering with a specialization in numerical acoustics from Trinity College, Dublin. (Matthew & Bharath, 11-12-2018, "Will disruptive technology cause nuclear war?", *Bulletin of the Atomic Scientists*, https://thebulletin.org/2018/11/will-disruptive-technology-cause-nuclear-war/)

Rather, we should think more broadly about how new technology might affect global politics, and, for this, it is helpful to turn to scholarly international relations theory. The dominant theory of the causes of war in the academy is the “bargaining model of war.” This theory identifies rapid shifts in the balance of power as a primary cause of conflict. International politics often presents states with conflicts that they can settle through peaceful bargaining, but when bargaining breaks down, war results. Shifts in the balance of power are problematic because they undermine effective bargaining. After all, why agree to a deal today if your bargaining position will be stronger tomorrow? And, a clear understanding of the military balance of power can contribute to peace. (Why start a war you are likely to lose?) But shifts in the balance of power muddy understandings of which states have the advantage.You may see where this is going. New technologies threaten to create potentially destabilizing shifts in the balance of power. For decades, stability in Europe and Asia has been supported by US military power. In recent years, however, the balance of power in Asia has begun to shift, as China has increased its military capabilities. Already, Beijing has become more assertive in the region, claiming contested territory in the South China Sea. And the results of Russia’s military modernization have been on full display in its ongoing intervention in Ukraine. Moreover, China may have the lead over the United States in emerging technologies that could be decisive for the future of military acquisitions and warfare, including 3D printing, hypersonic missiles, quantum computing, 5G wireless connectivity, and artificial intelligence (AI). And Russian President Vladimir Putin is building new unmanned vehicles while ominously declaring, “Whoever leads in AI will rule the world.” If China or Russia are able to incorporate new technologies into their militaries before the United States, then this could lead to the kind of rapid shift in the balance of power that often causes war. If Beijing believes emerging technologies provide it with a newfound, local military advantage over the United States, for example, it may be more willing than previously to initiate conflict over Taiwan. And if Putin thinks new tech has strengthened his hand, he may be more tempted to launch a Ukraine-style invasion of a NATO member.Either scenario could bring these nuclear powers into direct conflict with the United States, and once nuclear armed states are at war, there is an inherent risk of nuclear conflict through limited nuclear war strategies, nuclear brinkmanship, or simple accident or inadvertent escalation. This framing of the problem leads to a different set of policy implications. The concern is not simply technologies that threaten to undermine nuclear second-strike capabilities directly, but, rather, any technologies that can result in a meaningful shift in the broader balance of power. And the solution is not to preserve second-strike capabilities, but to preserve prevailing power balances more broadly.

# 4

#### Russia’s international ambitions are low now due to space sector failures. AFP 19

AFP 5/28/19 (Agence France-Presse - international news agency headquartered in Paris, “Moscow, we have a problem: theft plagues Russia’s space sector,” https://www.scmp.com/news/world/russia-central-asia/article/3012088/moscow-we-have-problem-theft-plagues-russias-space)

With millions of dollars missing and officials in prison or fleeing the country, Russia’s space sector is at the heart of a staggering embezzlement scheme that has dampened ambitions of recovering its Soviet-era greatness. For years, Moscow has tried to fix the industry that was a source of immense pride in the USSR. While it has bounced back from its post-Soviet collapse and once again become a major world player, the Russian space sector has recently suffered a series of humiliating failures. And now, massive corruption scandals at state space agency Roscosmos have eclipsed its plans to launch new rockets and lunar stations. “Billions (of roubles) are being stolen there, billions,” Alexander Bastrykin, the powerful head of Russia’s Investigative Committee – Russia’s equivalent of the FBI – said in mid-May. Investigations into corruption at Roscosmos have been ongoing “for around five years and there is no end in sight,” he added. In the latest controversy, a senior space official appears to have fled Russia during an audit of the research centre he headed. Yury Yaskin, the director of the Research Institute of Space Instrumentation, left Russia for a European country in April where he announced his resignation, the Kommersant paper reported. He feared the discovery of malpractice during an inspection of the institute, according to the newspaper’s sources. Roscosmos confirmed that Yaskin had resigned but did not clarify why. His Moscow institute is involved in developing the Russian satellite navigation system GLONASS designed to compete with the American GPS system. Corruption has particularly affected Russia’s two most important space projects of the decade: GLONASS and the construction of the country’s showpiece cosmodrome Vostochny, built to relieve Moscow’s dependence on Baikonur in ex-Soviet Kazakhstan. Almost all major companies in the sector, including rocket builders Khrunichev and Progress, have been hit by financial scandals that have sometimes led to prison sentences for large-scale fraud. Russia’s Audit Chamber, a parliamentary body of financial control, estimated that 760 billion roubles (around US$11.7 million) was misappropriated from Roscosmos in 2017, or nearly 40 per cent of the total misappropriated from the entire economy that year. Roscosmos said that “eradicating corruption” is one of its “primary goals”, adding that it regularly cooperates with investigations by the authorities. In mid-April, President Vladimir Putin stressed the need to “progressively resolve the obvious problems that slow down the development of the rocket-space sector.” “The time and financial frameworks to realise space projects are often unjustified,” the Russian leader Rebooting the space sector is a matter of prestige for the Kremlin. It symbolises its renewed pride and ability to be a major global power, especially in the context of increased tensions with the United States.

#### Space cooperation with the U.S. boosts Russia’s diplomatic leverage and international prestige

Juul 19 (Peter - senior policy analyst at the Center for American Progress, “Trump’s Space Force Gets the Final Frontier All Wrong,” 3/20/19, <https://foreignpolicy.com/2019/03/20/trumps-space-force-gets-the-final-frontier-all-wrong/>)

But funding isn’t everything, and in the new geopolitical context, democracy must be seen to work effectively. When it comes to space exploration, that means ratcheting back U.S. space cooperation with Russia as well as forgoing any equally intimate cooperation with China and its secretive space agency. The fact that the head of Russia’s space agency remains under U.S. sanctions for his role in Moscow’s military intervention in Ukraine illustrates the hazards involved in working with autocracies in space. Deep cooperation with autocratic powers in space gives autocracies a major point of diplomatic leverage over the United States, and more generally allows them to poach unearned international prestige by working on goals set and largely carried out by the United States. In today’s world, there’s no reason for the United States to give Russia or China this sort of standing by association.

#### Increased international prestige lays the foundation for Russian territorial expansion and foreign policy aggression

Gurganus 19 (Julia - nonresident scholar with the Russia and Eurasia Program at the Carnegie Endowment for International Peace & Eugene Rumer - senior fellow and the director of Carnegie’s Russia and Eurasia Program, “Russia’s Global Ambitions in Perspective,” 2/20/19, https://carnegieendowment.org/2019/02/20/russia-s-global-ambitions-in-perspective-pub-78067)

. Elsewhere, long-term conflicts, such as those in Afghanistan, Iraq, and Libya, or the unfinished business of post-conflict reconstruction, such as in the Balkans, have presented Russia with opportunities to insert itself and create new facts on the ground. In the United States and Europe, growing political divisions, the proliferation of information providers, and popular frustration with governing elites in the wake of the 2008 global financial crisis have exposed targets for Russian interference. Russian agents did not cause these long-term conflicts or cleavages inside Western societies, but they have used them to advance their goals, which vary depending on the circumstances. In many instances, the Kremlin has relied on a diverse toolkit that creates the appearance of operating one step removed from the Russian government (through a range of actors including state-owned corporations such as Rosatom and Rosneft, private security companies such as the Wagner Group, organized crime syndicates, hackers, and information operation organizations such as the Internet Research Agency). Western perceptions of post-Soviet Russia have been heavily affected by the country’s economic and political implosion and foreign policy retreat during the 1990s. Against that backdrop, the ambition and dynamism of Russian foreign policy since Putin’s 2012 return to the presidency appears to be a relatively new phenomenon. It isn’t. Moscow’s post-2012 foreign policy fits comfortably in the long-standing historical and intellectual tradition of Soviet and even pre-Soviet Russian foreign policy. THE TROIKA OF RUSSIAN FOREIGN POLICY Contemporary Russian foreign policy displays the unmistakable presence of three centuries-old drivers of Moscow’s posture on the world stage. Chief among these drivers is Russia’s quest for strategic depth and secure buffers against external threats, which, considering the country’s geography and absence of natural protective barriers between it and neighboring powers, has guided its geographic expansion. Along with physical insecurity and expansion, the second key driver of Russian foreign policy has been its ambition for recognition as a great power, which the Kremlin has long seen as necessary for legitimizing its geographic conquests and geopolitical ambitions. The third driver, related to the first two, is Russia’s complicated relationship with the West, which combines rivalry with the need for cooperation. These recurrent themes are important. They highlight the degree to which Russian foreign policy in the Putin era is a continuation of many pursuits that are, by turns, decades- and centuries-old and were embraced by previous Russian governments regardless of their political persuasion. The historical record also performs an important legitimizing function for the citizens of the Russian state, which is less than three decades old, cementing the state’s claim to be the heir to a long, illustrious tradition dating back centuries. References to this tradition thus legitimize the Putin government’s ambitious overseas pursuits and present them as a matter of historical continuity and as an integral part of what Russia is. GEOGRAPHY AND STRATEGIC DEPTH It is hard to overestimate the role of geography as a driver behind Russia’s foreign policy. The Russian state and its security policy have been shaped by the absence of natural geographic barriers—oceans, rivers, or mountains.2 Geography has shaped Russian identity and its rulers’ understanding of security throughout the entire existence of the Russian state. Throughout the centuries, contemporary Russia, the Soviet Union, imperial Russia, and the principality of Muscovy have all faced the challenge of securing a vast stretch of territory from neighbors perceived to be hostile to the west, south, and east. To secure its territory, the Russian state acquired more territory, which, in turn, had to be secured from ever-present external threats of one kind or another. In the words of historian Stephen Kotkin, “Whatever the original causes behind early Russian expansionism—much of which was unplanned—many in the country’s political class came to believe over time that only further expansion could secure the earlier acquisitions. Russian security has thus traditionally been partly predicated on moving outward, in the name of preempting external attack.”3 The loss of territory, as was the case after the two great dislocations Russia experienced in the twentieth century—first after the 1917 revolution and the 1918 Brest-Litovsk Treaty, and later after the 1991 breakup of the Soviet Union—resulted in a profound sense of Russian insecurity and a renewed quest to regain strategic depth. Regaining that depth was the key task of the Soviet government as soon as the country began to recover from the trauma of the revolution and the civil war, and again after Moscow regained a measure of strength after the collapse of the 1990s. GREAT POWER AMBITIONS The quest for recognition as a great power has been both the result of Russia’s geographic expansion and its driver. Geographic expanse was and is, in the eyes of Russian leaders, central to their claim to recognition as a great power. Such recognition, in turn, has been needed to lend a veneer of legitimacy to territorial conquests. Perhaps precisely because they have had to struggle repeatedly for such recognition, Russia’s rulers have been particularly sensitive to any suggestion that Russia does not belong in the ranks of major powers. In the mid-nineteenth century, Russian historian and writer Nikolay Danilevsky complained about Russia’s unfair treatment by Europe, which had turned a blind eye to Prussian and Austrian aggression against Denmark following the annexation of two Danish provinces yet criticized Russia’s efforts to protect the rights of its coreligionists in “barbaric” Turkey.4 Danilevsky’s complaint was, in effect, a precursor of Putin’s lament about the West’s double standards in dealing with Russia’s annexation of Crimea and the severing of Kosovo from Serbia.5 For the leaders of the independent Russia that emerged from the Soviet collapse, the Soviet and Russian imperial legacy appeared to serve as both an inspiration and a justification for their claim to great power status. They found ample philosophical rationales for their claim. In the words of noted Russian political philosopher Nikolai Berdyaev, empire and great power status constitute the essence of Russian identity even when the country is experiencing challenges and setbacks, in large part because of its spiritual and material wealth.6 As early as 1993, the official Foreign Policy Concept of the Russian Federation included, among other foreign policy priorities, the objectives of “furthering integration of the Commonwealth of Independent States” and ensuring Russia’s active role on the world stage as a “great power.”7 With Primakov’s rise to the helm of the Russian foreign policy establishment in 1996, great power ambitions again became the Kremlin’s driving force. In his first news conference as foreign minister, Primakov said, “Despite the present difficulties, Russia was and is a great power and its foreign policy should correspond with that.”8 Putin embraced this vision when he became president in 2000, and it has served as a cornerstone of his leadership ever since. Of particular importance to the Putin government has been the military record of the Russian state and its numerous conquests. Putin issued a presidential order in 2012 reconstituting the Russian Military-Historical Society.9 Long-serving Russian Culture Minister Vladimir Medinsky has been an active patron of the society as well. The expansion of the Russian state by force of arms—including numerous victories over Poland, Sweden, the Ottoman Empire, and Central Asia—make up an integral part of the foundational narrative of the contemporary Russian state. This narrative is reinforced by a sprawling state propaganda apparatus, official government activities, and educational curricula. Several historical events are featured prominently in this narrative. Russia’s defeat of Napoleon has been treated as a uniquely important event because of its significance to the European order in the nineteenth century, as well as for being an accomplishment that cemented Russia’s status as a great power. The victory over Nazi Germany in World War II is treated as the crowning achievement of the Soviet state, which saved not just the Soviet Union and Europe but the whole world from fascism. This triumph presently makes up the most important part of Russia’s national narrative. As a whole, this legacy provides both the justification and the motivation for Russia to pursue its ambitions not just around its vast periphery but well beyond its shores. UNEASY RELATIONS WITH THE WEST Moscow’s uneasy relationship with the West for centuries has been one of the most prominent features of its foreign policy. On the one hand—from Peter the Great’s founding of the new Russian capital on the Baltic shores to Catherine the Great’s engagement with leading European Enlightenment thinkers of the day, Czar Alexander I’s securing Russia’s place in the circle of major European powers to Joseph Stalin’s consolidation of the Soviet Union’s hold on Eastern Europe—Russia long has been an integral part of Europe and its political and security fabric. On the other hand, throughout Russian history since the time of Peter the Great, Russian elites, political thinkers, and cultural figures have questioned Russia’s European choice and relationship with Europe. In a more recent and very telling sign of that ambivalence, Foreign Minister Lavrov wrote in 2016 that, over the centuries, Russia has seen itself as part of Europe and the West, as better than the West, as different and unique from the West, and as representing a crucial link between the East and the West.10 The biggest obstacle that has kept Russia from having a closer and more stable relationship with Europe, according to Lavrov, has been Europe’s inability or unwillingness to simply let Russia be Russia, and its insistence on having Moscow conform to European norms—something that no Russian leader or the people of Russia would ever accept. Moscow’s claim to great power status has derived from its victories in the West, against Napoleon and Hitler. But Russia’s biggest setbacks too have been delivered by the West—in the Crimean War and in the Cold War—and these setbacks remain the biggest drivers of Moscow’s security and defense policy.11 As was the case during the Cold War, Russian policy toward the West has long had an important ideological dimension. During the Soviet era, the ideological competition was between Soviet communism and democratic capitalism. After a relatively brief period when Russia attempted to join the West, Moscow has embraced an overtly anti-Western ideology. Communism has been replaced by a mix of nationalist, authoritarian, and state-capitalist ideas as an alternative to the West’s notion of liberal democratic capitalism. The concept of Russia as a besieged fortress facing hostile Western designs and influences is a key tool the regime uses to mobilize the political support of Russian elites and ordinary citizens alike. OLD HABITS DON’T DIE In addition to a legacy of complicated geopolitics, great power ambitions, and a difficult relationship with the West, the new Russian state has inherited from its Soviet predecessor a time-tested foreign policy toolkit. While some elements of this toolkit fell into disuse early in the post-Soviet period when Russia was struggling with a series of domestic crises, these tools have been taken up again by the country’s foreign policy and national security establishment as Moscow has returned to the world stage as an increasingly assertive actor. George Kennan wrote in “The Sources of Soviet Conduct”: . . . the Kremlin is under no ideological compulsion to accomplish its purposes in a hurry . . . and it can afford to be patient. These precepts are fortified by the lessons of Russian history: of centuries of obscure battles between nomadic forces over the stretches of a vast unfortified plain. Here caution, circumspection, flexibility and deception are the valuable qualities . . . Its [the Soviet Union’s] political action is a fluid stream which moves constantly, wherever it is permitted to move, toward a given goal. . . . The main thing is that there should always be pressure, unceasing constant pressure, toward the desired goal. There is no trace of any feeling in Soviet psychology that that goal must be reached at any given time.12 Russian foreign policy in the Putin era fits Kennan’s description from more than half a century ago. The Kremlin’s approach has involved the relatively low-cost, limited use of military force in combination with other nonmilitary instruments of national power. Information operations, propaganda and disinformation, cyber operations, trade embargoes, and a vast array of other tools have been integrated into what has become commonly known as hybrid warfare. The current policy discussions in Western capitals often create the impression that Moscow has come up with a fundamentally new toolkit. In reality, an extensive reliance on such tools has long been a feature of Russian domestic politics and foreign policy.

#### Russian territorial expansion causes nuclear war with the U.S. and NATO

O’Hanlon 19 (Michael – PhD from Princeton in Public and International Affairs and currently a senior fellow at the Brookings Institute, “The Senkaku Paradox: Risking Great Power War Over Small Stakes,” p. 34-37, 4/30/19, Dartmouth Libraries)

As such, the United States and NATO partners would undoubtedly feel intense pressure, at the first sign of visible preparations for attack by Russia, to disable Russia’s surveillance and command and control capabilities and to preempt any missiles or aircraft or submarines before they could get within range of the target. That could, of course, entail direct attacks against airfields, ports, and other facilities on Russian soil, not just those that happened to be directly involved in the Baltic state occupation. In other words, NATO might strike first, rather than leave itself vulnerable to ambush. In light of the alliance’s consensus decision-making procedures, that possibility seems unlikely—but it must also be remembered that this scenario is premised on a situation in which Russian forces occupy at least a small swath of NATO territory, so certain thresholds would already have been crossed by enemy action. Regardless, the stage would be set for an extremely dangerous dynamic. If any initial conventional engagements went against its interests, Russia might also consider limited nuclear employment options. Indeed, some of its strategists currently entertain an “escalate to de-escalate” concept that would attempt to intimidate NATO allies into reversing their plans. Russia might detonate a nuclear weapon high in the atmosphere to create a powerful nuclear-induced electromagnetic pulse (EMP) that could prove lethal to air defense radars, military communications systems, and much civilian infrastructure over a region many hundreds of kilometers in radius. A Russian EMP burst using a high-altitude nuclear weapon would be an extremely provocative and risky move, to be sure.57 But some Russian leaders could argue that it was not strictly speaking a nuclear attack, since no humans would be killed by the direct explosive effects of such a weapon—and thus might delude themselves into thinking it was a relatively low-risk option. In fact, the risks could be very high. Some types of EMP attacks (or even cyberattacks) by Russia could disable large chunks of the U.S. or European electricity grids for many months.58 A severe attack of this type might even lead to a U.S. nuclear response, in light of the new nuclear doctrine of the Trump administration.59 Beyond the EMP option, Russia could use nuclear weapons directly against ships that carried military equipment, missile defense radars, or other capabilities. Indeed, it threatened to target nuclear missiles at any Danish ships joining the U.S.-led missile defense effort in 2015. Again, the provocation would be enormous—but the direct human stakes might be fairly limited, since only dozens of sailors, or at most a couple hundred, might be on a given naval vessel.60 Moscow might, perhaps delusionally, think the risks were acceptable. Of course, there would be enormous significance and risk to crossing the nuclear threshold in any way. But if weapons were used against isolated military targets (as both sides contemplated in various ways during the Cold War), Moscow again might convince itself, rightly or wrongly, that escalation risks could be tolerated and managed. That might be particularly true for attacks limited to the kinds of target sets that posed disproportionate vulnerability and dependence for NATO. These could include cargo ships at sea, rail marshaling yards where train tracks change gauge (necessitating unloading and reloading) at the Poland-Lithuania border, or particularly weak bridges without nearby alternative routes.61 If Russia could limit NATO fatalities to hundreds of sailors and not itself present any target sets that were characterized by a similar combination of relatively high military importance and relatively great separation from vulnerable civilian populations, NATO might not have a good recourse. Moscow might hope as much, at least—and so elect to roll the dice. Such a decision would be reckless and foolish, but perhaps not beyond the pale of how human beings have behaved historically in wars they felt they were otherwise likely to lose. The Outcome of the Scenario: Toward a Net Assessment With all these factors in motion, how would this kind of conflict likely play out? A NATO military response to the postulated Russian aggression seems very likely. Perhaps evidence of its preparations to move forces into position to defend its ally and liberate its territory from Russian occupation would be enough to catalyze a diplomatic resolution of the crisis. If not, however, the stage would be set for the possible eruption of World War III. Russia might try to impede a deployment through cyber-, space, and other such attacks, which would likely only slow the deployment, not stop it. Thus escalation could easily result.62 Once shots were fired, NATO would be unlikely to back down. Not every nation would necessarily send significant military forces, to be sure, but some key countries would probably remain resolute. Much more likely than acceptance of defeat would be a redoubled commitment to complete the mission—and, if Russian nuclear weapons had been used by that point, even in a limited attack, to respond in kind. Put differently, if Russia did choose to try to physically prevent the deployment of large forces into eastern NATO territory in likely preparation for a counterattack, there would be two possibilities. If that attempt failed, a showdown in the east on land would still loom. If it succeeded, NATO would then face a momentous decision: accept defeat, or reinforce dramatically with conventional forces (perhaps after a period of repairing damage and building more equipment and weaponry, depending on how many losses it had already suffered), or escalate to the nuclear level. In situations of this sort, the parties to the conflict might find themselves living scenarios like those that nuclear theorists pondered throughout the Cold War. They could be engaged in behavior that Thomas Schelling might have described as “the threat that leaves something to chance” or that Herman Kahn might have placed on the lower rungs of a nuclear escalation ladder that reached potentially to all-out war.63 American planners saw these kinds of escalatory ladders and options as ideas that might serve U.S. interests; thus it would not be too surprising to see Russian planners invoke them now.64 And whatever the dangers during the deployment phase, they would snowball during any actual maneuver warfare in eastern Europe. For example, it is entirely imaginable that an operation designed to liberate a Baltic state from a Russian occupation would trespass onto Russian territory to cut off supply lines and possible reinforcements.65 Moscow may or may not simply take NATO’s word that it has no designs on the country’s government. In other words, it might even fear that NATO’s counteroffensive could aspire to regime change in Russia. It may or may not have a clear picture of the kind of attack it is experiencing, as command and control systems would be compromised in the course of conventional battle, quite possibly including those systems commonly used for nuclear weapons.66 I conclude that, for a hypothetical conflict occurring sometime in the near future, enough uncertainties exist to make the outcome of the war somewhat unpredictable. One cannot simply assert that NATO’s numerous advantages guarantee a victory. The Baltics’ exposed geographic location, NATO’s limited means of deploying reinforcements to the region reliably, Russia’s options in domains ranging from cyberspace to outer space, and the possible use of nuclear weapons even in just a limited, tactical role make it uncertain that NATO could confidently expect victory despite collectively outspending Russia by more than ten to one in the military arena. For example, it is not clear that the United States could safely send most of its major ocean transport vessels to ports of debarkation and unload supplies there in the face of a conventional military threat. And if it lost a substantial fraction of its top-line supplies and ships to Russian attacks in its first attempt, the United States might need time to prepare for a second effort, which might then have to begin further west in Europe where disembarking and marshaling of forces could be carried out more safely, before those forces gradually made their way eastward. NATO would probably win such a conventional war, but it could take many months or even years. And even then, the deep uncertainties associated with possible nuclear escalation make it unclear whether victory could even be meaningful. Few would say that a few thousand square kilometers of Baltic territory logically warrant nuclear risks. But human beings are not always logical. Nuclear brinkmanship over a limited-war scenario in eastern Europe would not be unthinkable, based on what we know of history and human nature. And if nuclear weapons were ever used, even in small numbers at first, all bets are off as to where and how the conflict would end.

# Case

Plan flaw – literally just doesn’t make any sense – nuclear cnc satellites don’t DO appropriation

Cant solve – only one of their cards talks about private nuclear command and control satellites, all the rest of the ev is about public sector which means that public would just do it anyway

No cost cutting offense – even if its true broadly, obviously wouldn’t be true for companies doing MILITARY CONTRACTS FOR NUCLEAR CNC

#### 1) Cyber-attacks not happening in squo – there has not even been ONE cyberattack on our nuclear OR conventional weapons arsenals – make them give you even a single example before pulling the trigger

#### 2) No motivation, it will kill them – states know that cyberattacks will cause retaliation which will obliterate them

3) Even if they get cyberattacked, there is no nuclear explosion – external confirmations deter annd unauthorized launches would go into the ocean

Slocombe 9

Walt Slocombe, Former Under Secretary of Defense for Policy, June 2009, De-Alerting: Diagnoses, Prescriptions, and Side-Effects, http://www.ewi.info/system/files/Slocombe.pdf

Whatever other problems the current nuclear posture of the US nuclear force may present, it cannot reasonably be said to be on a “hair trigger.” Since the 1960s the US has taken a series of measures to insure that US nuclear weapons cannot be detonated without the receipt of both external information and properly authenticated authorization to use that information. These devices – generically Permissive Action Links or “PALs” – are in effect combination locks that keep the weapons locked and incapable of detonation unless and until the weapons’ firing mechanisms have been unlocked following receipt of a series of numbers communicated to the operators from higher authority. Equally important in the context of a military organization, launch of nuclear weapons (including insertion of the combinations) is permitted only where properly authorized by an authenticated order. This combination of reliance on discipline and procedure and on receipt of an unlocking code not held by the military personnel in charge of the launch operation is designed to insure that the system **is** “fail safe,” i.e., that **whatever mistakes occur, the** result will not be a nuclear explosion. Moreover, in recent years, both the US and Russia, as well as Britain and China, have modified their procedures so that even if a nuclear-armed missile were launched, it would go not to a “real” target in another country but – at least in the US case - to empty ocean. In addition to the basic advantage of insuring against a nuclear detonation in a populated area, the fact that a missile launched in error would be on flight path that diverged from a plausible attacking trajectory should be detectable by either the US or the Russian warning systems, reducing the possibility of the accident being perceived as a deliberate attack. De-targeting, therefore, provides a significant protection against technical error.5

#### No spoofing escalation---countries prefer caution.

Dr Beyza **Unal &** Dr. Patrcia **Lewis** **18**. \*\*Research fellow with the International Security Department at Chatham House. \*\*Research director of the International Security Department at Chatham House. “Cybersecurity of Nuclear Weapons Systems Threats, Vulnerabilities and Consequences.” Chatham House. January. https://www.chathamhouse.org/sites/default/files/publications/research/2018-01-11-cybersecurity-nuclear-weapons-unal-lewis-final.pdf.

At the national level, in times of uncertainty, states will tend to **err** on the side of **shifting away from behaviour that could be misinterpreted**. Russia, for instance, cancelled its air force exercises and called off planned missile testing in response to the 11 September 2001 Al-Qaeda attack.85 The continuation of this type of behaviour will help **prevent unintentional escalations** at times of heightened tensions, particularly when time is limited and there is political and public pressure to respond to an attack.¶ Cybersecurity preparedness requires the analysis of possible cyber risk scenarios and an evaluation of threat vectors and consequences. There are nine countries that possess nuclear weapons and therefore, at a minimum, 18 scenarios involving two actors, an aggressor and a defender.86 The likelihood of these scenarios and survivability of nuclear forces should be examined in detail in these studies. Survivability of nuclear forces differs from country-to-country and country-specific analysis should be incorporated in preparations. Defence planners already usually account for system failures and an opponent’s defence mechanisms in their targeting strategies, a useful addition to this would be to take into account cyberattacks and their consequences. By understanding such pressures states can explore arms control and other **cooperative security measures to** reduce **miscalc**ulation and avoid unintentional destabilizing actions.

#### Collision risk is tiny

Wein 9 [Lawrence M. Wein, Professor & Senior Fellow at Stanford’s Center for International Security and Cooperation Jeffrey S. Skoll Professor of Management Science at Stanford University and Senior Fellow at Stanford’s Center for International Security and Cooperation, former DEC Leaders for Manufacturing Professor of Management Science at MIT, and Andrew M. Bradley, PhD-Institute for Computational and Mathematical Engineering at Stanford University, Space debris: Assessing risk and responsibility, Advances in Space Research 43 (2009) 1372–1390]

More importantly, while our numerical results mimic earlier results (Liou and Johnson, 2005; Walker and Martin, 2004) that stressed the importance of postmission deorbiting, we do not necessarily agree with the claim that the only way to prevent future problems is to remove existing large intacts from space (Liou and Johnson, 2006, 2008). The divergence between our views and those in Liou and Johnson (2006, 2008) is perhaps due to the different performance metrics used. The root causes for alarm in Liou and Johnson (2006, 2008) appear to be the growth rate of fragments and the small increase in the rate of catastrophic collisions over the next 200 years (Liou and Johnson, 2008, Fig. 2). However, the great majority of catastrophic collisions in the SOI do not involve operational spacecraft, and are hazardous only in the sense that the fragments generated from such a collision could subsequently damage or destroy operational spacecraft. Therefore, we introduced the notion of the lifetime risk of an operational spacecraft as the primary performance metric. Our model predicts that the lifetime risk is <5x10^-4 [less than .0005%] over the next two centuries, and always stays <10^-3 [less than .001%] than if there is very high (>98%) spacecraft deorbiting compliance. These risks appear to be low relative to the immense cost and considerable technological uncertainty involved in removing large objects from space, are dwarfed by the ~20% historical mission-impacting (but not necessarily mission-ending) failure rate of spacecraft (Frost and Sullivan, 2004), and could be overestimated if improved traffic management techniques lower future collision risks (Johnson, 2004). Hence, the need to bring large objects down from space does not appear to be as clear cut as suggested in Liou and Johnson (2006, 2008). Nonetheless, our model does not incorporate the possibility of intentional catastrophic collisions (ASAT tests, space wars) that could conceivably occur in the future. In addition, Fig. 5 considers only catastrophic collisions, whereas noncatastrophic intact-fragment collisions could easily disable an operational spacecraft. If the operational lifetime risk is modified to include noncatastrophic collisions with fragments >= 10cm, then the sustainable risk rises by ~50%: it increases from 2.19x10^-2 [.0219%] to 3.09x10^-2 in the base case, and increases from 4.91x10^-4 [.000491%] to 7.94x10^-4 in the full compliance case. Moreover, if fragments >= 1 cm (rather than >= 10 cm) are harmful to spacecraft (Johnson, 2004), then we (as well as other researchers) could be underestimating the risk.

#### Public sector launch makes ozone impacts nonunique but turn – only private sector innovation solves greener fuels

Mortillaro 2021 [Nicole Mortillaro, Nicole. “Rocket Launches Could Be Affecting Our Ozone Layer, Say Experts | CBC News.” *CBCnews*, CBC/Radio Canada, 23 Apr. 2021, https://www.cbc.ca/news/science/rocket-launches-environment-1.5995252.]

Rocket launches are a breathtaking culmination of human ingenuity as they propel us into the future, but there is a growing concern that not enough research has been done on their effect on the environment. While some may be worried about potential greenhouse gas emissions that's not the main issue. Instead, it's ozone depletion and the potential effects in our upper atmosphere, specifically the stratosphere, along with concerns about toxic fuels. The problem has flown under the radar, according to Martin Ross, an atmospheric scientist at The Aerospace Corporation, because people still think of rocket launches as rare But it's time to face the fact that we may be entering a boom era, he said. "One of the arguments that people have used in the past was to say that we don't really need to pay attention to rockets or to the space industry, or the space industry is small, and it's always going to be small," Ross said. "But I think the developments that we're seeing the past few years show that … space is entering this very rapid growth phase like aviation saw in the '20s and '30s." Black soot in the atmosphere The stratosphere is an important weather driver for Earth's systems, and that's where some particles from rocket launches are ending up. The ozone layer, which helps protect us from the sun's harmful ultraviolet rays, is also located in the stratosphere. In 1990, the [Montreal Protocol was signed into law](https://ozone.unep.org/treaties/montreal-protocol), banning harmful ozone-depleting substances, such as chlorofluorocarbons (CFCs), used in things like refrigerators and air conditioners, after it was revealed that the ozone layer was being stripped away by these chemicals. While the protocol touched on airlines, there was no mention of the aerospace industry. But now some industry experts are concerned that with no oversight, we could be in for a problem. There are different types of rocket propellants. Some, like liquid oxygen and liquid hydrogen, produce mainly water vapour and have little environmental impact. These were used in past shuttle launches and even in the Apollo-era Saturn V vehicles. Then there are those that produce alumina particles in the stratosphere, such as those in solid rocket boosters, which were also used in past shuttle launches, and are still being used today by some launch companies. Finally, there are those that deposit black soot in the stratosphere, such as kerosene used in SpaceX's Falcon 9 and Russia's Soyuz rockets. It's the alumina and black soot that is most concerning to experts. "The atmosphere is complex," said Jessica Dallas, a PhD candidate at the Australian Centre for Space Engineering Research, in New South Wales. "We don't have a complete understanding of atmospheric circulation and how all of the mechanisms in the atmosphere actually work. And so that means that we also don't have a good idea of what happens when we're injecting these particles into the stratosphere." Dallas, who wrote a [comprehensive analysis of research on rocket propellants](https://www.sciencedirect.com/science/article/abs/pii/S0959652620302560), said that she's concerned that there haven't been studies on how these particles interact in our atmosphere. "Things tend to stay in the stratosphere for a long time, because there's actually a very low rate of mixing [lower in the atmosphere]," she said. "So what you're having is black particles being deposited into the stratosphere and then they're staying in the stratosphere for something like three or four years … whereas with the alumina particles, they sort of stay a little more locally, because they're larger and heavier." While experts say these rocket emissions aren't a pressing problem now, there's concern they will become one as the industry grows. Launches into space are far from rare: In 2016, there were roughly 80; in 2018, there were about 111, marking the first time since 1990 that there were more than 100 launches. Since then, there have been close to 100 launches annually, and as of April 20, there have already been 30 launches this year, with half of them from the United States alone. And there doesn't seem to be any indication of it slowing down. On the contrary: with more and more countries getting involved in the "new space race," smaller and cheaper satellites and NASA and commercial entities like SpaceX and Blue Origin eyeing the moon and possibly Mars, there is likely to be an increase in launches. In a [2018 report by The Aerospace Corporation's Center for Space Policy and Strategy](https://aerospace.org/paper/policy-and-science-rocket-emissions), the authors compared the potential of atmospheric rocket emissions to that of orbital space debris — another problem that wasn't tackled when it was small half a century ago. Today, spent rocket engines, defunct satellites or debris from collisions are a threat to satellites and even the International Space Station. Several space agencies, including NASA and the European Space Agency, as well as private companies, are trying to develop ways to either collect it or mitigate it. "If the potential magnitude of the space debris problem had been recognized early in the space age, and coordinated international actions had been taken at the time to address it, space debris may not have become the significant risk we face today," the authors wrote. "Today, launch vehicle emissions present a distinctive echo of the space debris problem." Aside from the atmospheric impacts, there's also the danger to the environment here on Earth. Producing some fuels, such as hydrazine used mainly in satellites, is highly toxic and carcinogenic. There's also a risk of spills. But there are some companies trying to develop fuel that may not only be less toxic here on Earth, but also in the atmosphere. Tomislav Friscic, a professor in the chemistry department at McGill, is developing a new type of propellant that can be used for satellites in orbit that doesn't use hydrazine. Instead, it's a metal-organic framework (MOF), where molecules form a literal framework. "Because this framework is full of holes, and you can put things in them, that means you have a material which you can modify on a number of levels," Frscic said. "You can put high energy components in them to increase energy density ... and make a material that is more responsive or maybe less responsive, if needed." And there's a lot of Canadian research going on in terms of "greener" fuel, including by Quebec-based companies like Advanced Chemical Synthesis and Manufacturing (ACSYNAM) and Reaction Dynamics. "My vision of how things are going to be is that we're not limited anymore by the chemical limitations that we have," said Cristina Mottillo, co-founder of ACSYNAM. "My vision is that … we can actually learn more about how to unlock the chemical energy in in the new propellant candidates … versus just happening to find chemicals from the periodic table that have the necessary chemical energy." But even those agencies or companies launching today are looking for better options. SpaceX's Starship, which CEO Elon Musk hopes will one day ferry people to the moon or Mars, is in its testing phase, but unlike its Falcon 9 rocket, it uses methane and liquid oxygen, which burns cleaner compared to some of the other available propellants. And in 2019, NASA conducted its own test of a greener fuel. While the good news is that there's research going on, there's more that's needed from players around the globe, Dallas said.

#### Launches inevitable

Helsinki Times 21 – “Global orbital rocket launches surge by 44% in H1 2021, U.S. leads,” 7/15/2021, https://www.helsinkitimes.fi/business/19596-global-orbital-rocket-launches-surge-by-44-in-h1-2021-u-s-leads.html

Space missions are increasingly becoming popular, with companies moving towards enabling private citizens to have a glimpse of the orbit away from the professional astronauts. The interest in space travel is increasing the number of orbital launches. Data acquired by Finbold indicates that the global number of orbital rockets launched in 2021 H1 surged 43.9% compared to the first half of 2020. As of 2021, the orbital rocket launches stood at 59, while last year, the figure was at 41. In 2021, the United States showed dominance, accounting for about 49% of the launches at 29. China recorded 18 launches, followed by Russia at seven. French space company Arianespace accounts for four orbital launches. The numbers are based on RocketLaunch.live data, which tracks orbital rocket launches worldwide. Space tourism driving increase in orbital launches The increase in orbital launches during the period highlights the increasing focus to make space travel a routine. The sector has witnessed the entry of private companies working towards making space travel available for private citizens and not just the professional astronauts of space agencies like NASA. Worth mentioning is that despite 2020 being a challenging year due to the coronavirus pandemic, several space missions were initiated, with some arriving at their destination in 2021. The increase in orbital launches also correlates with the entry of private companies into the sector that are jostling to make a name for themselves in space. For instance, Jeff Bezos’ Blue Origin company is expected to have the inaugural space flight with the founder on board on July 20, 2021. Notably, Virgin Galactic (SPCE) offered a glimpse of space tourism after the company’s aircraft successfully conducted a space mission with founder Sir Richard Branson on board. Virgin Galactic may begin flying the first paying passengers next year after two more test flights. However, with tickets running into hundreds of thousands of dollars, the space experience remains viable for financially able individuals. But when the companies begin commercial operations, Blue Origin and Virgin Galactic will be direct competitors. Elsewhere, Elon Musk’s SpaceX is also an active player in the space industry with a reputation for conducting multiple short test flights over the past year. The company’s next step is to reach orbit. Furthermore, competition between private companies is also heating up. For instance, Arianespace, the world’s first commercial launch company that dominated the market for sending big communications satellites into orbit, is now shifting its focus to smaller satellites. This shift is likely to give companies like SpaceX a run for their money.

#### No ozone impact

**Ridley 14** -- Matthew White Ridley, 5th Viscount Ridley DL FRSL FMedSci, known commonly as Matt Ridley, is a British journalist, businessman and author of popular science books. Since 2013 Ridley has been a Conservative hereditary peer in the House of Lords. “THE OZONE HOLE WAS EXAGGERATED AS A PROBLEM” http://www.rationaloptimist.com/blog/the-ozone-hole-was-exaggerated-as-a-problem.aspx

Serial hyperbole does the environmental movement no favours My recent [Times column](http://www.thetimes.co.uk/tto/opinion/columnists/article4206440.ece) argued that the alleged healing of the ozone layer is exaggerated, but so was the impact of the ozone hole over Antarctica: The ozone layer is healing. Or so said the news last week. Thanks to a treaty signed in Montreal in 1989 to get rid of refrigerant chemicals called chlorofluorocarbons (CFCs), the planet’s stratospheric sunscreen has at last begun thickening again. Planetary disaster has been averted by politics. For reasons I will explain, this news deserves to be taken with a large pinch of salt. You do not have to dig far to find evidence that the ozone hole was never nearly as dangerous as some people said, that it is not necessarily healing yet and that it might not have been caused mainly by CFCs anyway. The timing of the announcement was plainly political: it came on the 25th anniversary of the treaty, and just before a big United Nations climate conference in New York, the aim of which is to push for a climate treaty modelled on the ozone one. Here’s what was actually announced last week, in the words of a Nasa scientist, Paul Newman: “From 2000 to 2013, ozone levels climbed 4 per cent in the key mid-northern latitudes.” That’s a pretty small change and it is in the wrong place. The ozone thinning that worried everybody in the 1980s was over Antarctica. Over northern latitudes, ozone concentration has been falling by about 4 per cent each March before recovering. Over Antarctica, since 1980, the ozone concentration has fallen by [40 or 50 per cent each September](http://bigstory.ap.org/article/scientists-say-ozone-layer-recovering) before the sun rebuilds it. So what’s happening to the Antarctic ozone hole? Thanks to a diligent blogger named Anthony Watts, I came across a press release also from Nasa about nine months ago, which said: “ Two new studies show that signs of recovery are not yet present, and that temperature and winds are still driving any annual changes in ozone hole size.” As recently as 2006, Nasa announced, quoting Paul Newman again, that the Antarctic ozone hole that year was “the largest ever recorded”. The following year a paper in Nature magazine from Markus Rex, a German scientist, presented new evidence that suggested CFCs may be responsible for less than 40 per cent of ozone destruction anyway. Besides, nobody knows for sure how big the ozone hole was each spring before CFCs were invented. All we know is that it varies from year to year. How much damage did the ozone hole ever threaten to do anyway? It is fascinating to go back and read what the usual hyperventilating eco-exaggerators said about ozone thinning in the 1980s. As a result of the extra ultraviolet light coming through the Antarctic ozone hole, southernmost parts of Patagonia and New Zealand see about 12 per cent more UV light than expected. This means that the weak September sunshine, though it feels much the same, has the power to cause sunburn more like that of latitudes a few hundred miles north. Hardly Armageddon. The New York Times reported “an increase in Twilight Zone-type reports of sheep and rabbits with cataracts” in southern Chile. Not to be outdone, Al Gore wrote that “hunters now report finding blind rabbits; fisherman catch blind salmon”. Zoologists briefly blamed the near extinction of many amphibian species on thin ozone. Melanoma in people was also said to be on the rise as a result. This was nonsense. Frogs were dying out because of a fungal disease spread from Africa — nothing to do with ozone. Rabbits and fish blinded by a little extra sunlight proved to be as mythical as unicorns. An eye disease in Chilean sheep was happening outside the ozone-depleted zone and was caused by an infection called pinkeye — nothing to do with UV light. And melanoma incidence in people actually levelled out during the period when the ozone got thinner. Then remember that the ozone hole appears when the sky is dark all day, and over an uninhabited continent. Even if it persists into the Antarctic spring and spills north briefly, the hole allows 50 times less ultraviolet light through than would hit your skin at the equator at sea level (let alone at a high altitude) in the tropics. So it would be bonkers to worry about UV as you sailed round Cape Horn in spring, say, but not when you stopped at the Galapagos: the skin cancer risk is 50 times higher in the latter place. This kind of eco-exaggeration has been going on for 50 years. In the 1960s Rachel Carson said there was an epidemic of childhood cancer caused by DDT; it was not true — DDT had environmental effects but did not cause human cancers. In the 1970s the Sahara desert was said be advancing a mile a year; it was not true — the region south of the Sahara has grown markedly greener and more thickly vegetated in recent decades. In the 1980s acid rain was said to be devastating European forests; not true — any local declines in woodland were caused by pests or local pollution, not by the sulphates and nitrates in rain, which may have contributed to an actual increase in the overall growth rate of European forests during the decade. In the 1990s sperm counts were said to be plummeting thanks to pollution with man-made “endocrine disruptor” chemicals; not true — there was no fall in sperm counts. In the 2000s the Gulf Stream was said to be failing and hurricanes were said to be getting more numerous and worse, thanks to global warming; neither was true, except in a Hollywood studio. The motive for last week’s announcement was to nudge world leaders towards a treaty on climate change by reminding them of how well the ozone treaty worked. But getting the world to agree to cease production of one rare class of chemical, for which substitutes existed, and which only a few companies mainly in rich countries manufactured, was a very different proposition from setting out to decarbonise the whole economy, when each of us depends on burning carbon (and hydrogen) for almost every product, service, meal, comfort and journey in our lives. The true lesson of the ozone story is that taking precautionary action on the basis of dubious evidence and exaggerated claims might be all right if the action does relatively little economic harm. However, loading the entire world economy with costly energy, and new environmental risks based on exaggerated claims about what might in future happen to the climate makes less sense.