# 1NC

## 1

### OFF

#### Ukraine war is optimistic, but maintaining outside support is key

* Ukraine getting outside help from west
* Kyiv’s history in soviet union and ties to Russia lowers morale
* Low morale destroys new conscriptions which is key for Russia
* Gives example of Ukrainian propaganda dissolving Russian army

Knispel 3-9 [Sandra Knispel, (Hein Goemans, a professor of political science at the University of Rochester, is an expert on international conflicts—on how they begin and end.) 3-9-2022, "How to end the war in Ukraine," NewsCenter, https://www.rochester.edu/newscenter/how-to-end-the-ukraine-war-514522/] Jet

Q&A with Hein Goemans One or both sides must change their demands as a precursor to ending the war. What’s likely to happen in the current scenario? Putin made a big mistake by committing himself to total victory in Ukraine. Goemans: It depends on the performance on the battlefield, and a country’s expectations of outside help. Russia should have become more pessimistic in the last few days because Ukraine has shown its ability to inflict far greater costs on Russia than the Kremlin had anticipated. One would expect Russia therefore to lower its demands but we’ve seen very little evidence of that so far—only the demand of denazification seems to have been dropped. Overall, Putin still maintains that everything is going according to plan. If this continues, Ukrainian sovereignty may be at stake, which is dangerous and perhaps even stupid of Putin, who seems to be committing himself to total victory. If he can’t get it, he’ll be responsible and that makes a coup against him more likely. How has the situation changed for Ukraine and its demands for ending the war? Ukraine right now is not likely to accept anything less than full independence as a nation. Goemans: Ukraine must have gotten a lot more optimistic in recent days. Not just because its army has been doing reasonably well but because of the demonstrated incompetence of the Russian army. Yes, the Russians are still much stronger and much bigger, but there are problems with morale in the Russian army, and you see the remarkable level of Ukrainian support from the West. Ukrainians are still fighting for independence of their homeland and may maintain their claims to Luhansk and Donetsk in the Donbas region in south-eastern Ukraine. I don’t know whether they’d willing to give up Crimea at this point. One avenue worth exploring in peace negotiations might be true plebiscites, overseen by international observers. Can Putin credibly commit not to go beyond the invasion of Ukraine? In his February 21 speech, he expressed his aim to reconstitute the Russian Empire. Goemans: No, he cannot. Nobody would believe him if he said he’d stop at Ukraine. People are pointing to the failed attempt to appease Hitler with the Munich Agreement in 1938. So that’s a non-starter, especially with Putin’s February 21st speech in which he said he wants to reconstitute greater Russia or the Russian Empire. Western nations can no longer say, ‘Oh, he doesn’t mean that. We can still do business there and we can have gas if we give him just a little bit, maybe two Ukrainian towns or so.’ He made that impossible. Yes, the analogy is overused, but it really is like Hitler in 1938. People heard the speech and the appeasement alarm bells went off. Global view of Russia and former Soviet satellite countries labeled. (University of Rochester illustration / Michael Osadciw) A deciding factor in this war is going to happen in the next couple of weeks. Can you explain the role of Russian conscripts in this context? The question is how many new conscripts will actually show up because it’ll determine the strength of the Russian army on the ground in Ukraine. Goemans: There are two things to keep in mind: First, the new Russian conscription class is going to be drafted in April. It’ll be very informative to see how many people do not show up. Secondly, are the Russians really going to bomb Kyiv, a so-called “hero city of the Soviet Union,” into rubble like they did with Chechnya’s capital Grosny? Are they willing to kill tens of thousands of people? Those two benchmarks will happen in the next few weeks. How precarious is the situation for Putin’s own survival? He may keep fighting, even if he knows he’s losing, because the alternative may mean signing his own death warrant. Goemans: Putin may count on the fact that Ukrainians will give in if Kyiv is bombed. But if they don’t, that should make him more pessimistic. One would think that he’d have to lower his demands, and that at that point, some kind of deal would be possible. But Putin must come home with some kind of victory because otherwise he’s literally dead. That means he may keep fighting, even if he knows he’s losing, because the alternative is signing his own death warrant. That’s what happened in the First World War. Germany kept fighting for years, even though the leadership knew that they were losing within the first weeks of the war. You’re not hyperbolic when you say Putin is signing his own death warrant with a defeat? History has plenty of examples here. Goemans: No, I’m not. In a regime like Russia—which is clearly not a democracy, but also not quite a dictatorship—if you win a war, you’re the great hero; if you lose a war, you have shown your incompetence and you’ll be removed, which I have explored in my own research. You’ll be held as what’s known as a “culpable leader”—culpable for the fact that the gains of the war do not outweigh the losses. Historically such leaders have been removed from office, and they either have gone into exile, or have been jailed or killed. A recent example is the former Yugoslav President Slobodan Milosevic. What’s frightening, and there are already signs of this, is that Putin is moving towards a dictatorship because only full repression will prevent a coup against him. In that case, both the Russian and the Ukrainian people will suffer horribly. What do you think would happen with the war if Putin’s regime were to be overthrown? “Most likely, Ukraine would strengthen its demands and now want Crimea back.” Goemans: It’s possible that the entire Russian superstructure would be wiped out—not just Putin, but all his cronies, his security advisers, the oligarchs. That whole top layer could be removed. So the question is, if there’s a coup against Putin, what would the new Russian government insist on? They’re not necessarily all going to say, “Okay, sorry Ukraine, we made a mistake. Please excuse us.” And Ukrainians would not necessarily accept that anyway. Most likely, Ukraine would strengthen its demands and want Crimea back. Putin has said he wants to effect regime change in Ukraine—would a new government even have any credibility with Ukrainians? Ukrainians have become unified against Russia. Goemans: I don’t think so. There’s a new serious form of unity among the Ukrainian people and Ukrainian identity, and it’s in direct opposition to the Russians. It would be very dangerous for any Ukrainian government to be seen as colluding with Russia. Any such attempt would likely result in the formation of independent fighting units that would keep going to get the Russians out of Ukraine. What are the minimum terms the West can accept? The West cannot accept Putin’s winning in Ukraine, but they might we willing to accept concessions on the Luhansk and Donetsk regions, if Ukraine is willing to entertain that. Goemans: That’s an important question. The West—that is Western Democracies—cannot, in my opinion, accept a victorious Putin. The West is genuinely and correctly afraid of “salami tactics”—if he takes Ukraine, he will next take Georgia, and then he will go to the Baltics. Annexation wouldn’t end, so it has to stop now. Particularly because Putin so unmistakably declared his intentions in that speech on February 21st. Would the West accept Crimea as being Russian? I don’t know. Would the West accept Luhansk along the provincial administrative borders (which is not the same as the current line of control, which is currently roughly half of the of the provinces)? I doubt that. I think the West may demand a return to the status quo ante. I don’t know if they can get that. Maybe Ukraine would have to give up the entire administrative region of Luhansk and Donetsk. But the West will want to go back to the status quo. When do you think the war will end? Either in the next month and a half, or it’ll be years. Goemans: Either in the next month and a half, or it’ll be years. Months, if the new class of Russian conscripts in April fails to turn up. Otherwise I’m not optimistic. It’ll be ongoing bloodshed, pulverizing of Ukrainian cities, coupled with insurgencies, and Russia will never have full control of Ukraine. But going back to the video of the captured Russian soldier who was ashamed of taking part in the invasion of Ukraine: If he returns to Russia, he’ll most likely be killed. Yet, he’s speaking up and he’s hoping that he affects another guy, and then maybe two other guys, and it spreads like that. That’s how an army dissolves. On the other hand, that’s also how a Ukrainian army becomes more determined.

#### Russian invasion has been shutting down Internet access in Ukraine – private companies like Starlink are key to keeping Ukraine above the water.

**Lerman and Zakezewski 3/19** [[Rachel Lerman](https://www.washingtonpost.com/people/rachel-lerman/) and [Cat Zakrzewski](https://www.washingtonpost.com/people/cat-zakrzewski/), March 19, 2022, Elon Musk’s Starlink is keeping Ukrainians online when traditional Internet fails, [https://www.washingtonpost.com/technology/2022/03/19/elon-musk-ukraine-starlink //](https://www.washingtonpost.com/technology/2022/03/19/elon-musk-ukraine-starlink%20//) JB]

Elon **Musk** recently [challenged](https://twitter.com/elonmusk/status/1503327421839417344?s=20&t=l8tFMcRaAnROg29kaPIyIw) Russian President Vladimir Putin to a one-handed fist**fight** for the future of **Ukraine**. But the entrepreneur’s real **defense** of the besieged country is his effort to keep Ukrainians online with shipments of **Starlink satellite Internet service**.

**Starlink** is a unit of [Musk’s space company, SpaceX.](https://www.washingtonpost.com/technology/2021/11/02/satellite-internet-starlink-kuiper-faq/?itid=lk_inline_manual_4)The service uses terminals that resemble TV dishes equipped with antennas and are usually mounted on roofs to access the **Internet via satellite** in rural or disconnected areas.

When war broke out in Ukraine, the **country** faced threats of Russian **cyberattacks** and shelling that had the potential to **take down the Internet**, making it necessary to develop a backup plan. So the country’s minister of digital transformation, Mykhailo Fedorov, tweeted a direct plea to Musk urging him to send help. Musk replied just hours later: “Starlink service is now active in Ukraine. More terminals en route.”

[The latest space race is all about improving Internet access. Here’s what you should know.](https://www.washingtonpost.com/technology/2021/11/02/satellite-internet-starlink-kuiper-faq/?itid=lk_interstitial_manual_6)

**Ukraine** has already received thousands of antennas from Musk’s companies and European allies, which has proved “very **effective**,” [Fedorov](https://www.washingtonpost.com/technology/2022/03/02/mykhailo-fedorov-ukraine-tech/?itid=ap_catzakrzewski&itid=lk_inline_manual_7) said in an interview with The Washington Post on Friday.

“The **quality** of the link is **excellent**,” Fedorov said through a translator, using a Starlink connection from an undisclosed location. “We are using **thousands**, in the area of thousands, of terminals with new **shipments** arriving every other day.”

[The Ukrainian leader who is pushing Silicon Valley to stand up to Russia](https://www.washingtonpost.com/technology/2022/03/02/mykhailo-fedorov-ukraine-tech/?itid=ap_catzakrzewski&itid=lk_interstitial_manual_11)

The use of Starlink as a stopgap measure for citizens and the government to stay **connected during an invasion** is a major test of the relatively new technology, experts say, and could have widespread **implications** for the **future of war**. Internet has become an **essential tool** for **communication**, staying informed and even powering weapons.

#### It’s key to infrastructure and preventing more cyberattacks and miscalculated escalation

**Menn and Timberg 2/28** [[Joseph Menn](https://www.washingtonpost.com/people/joseph-menn/) and [Craig Timberg](https://www.washingtonpost.com/people/craig-timberg/), 2/28/22, The dire predictions about a Russian cyber onslaught haven’t come true in Ukraine. At least not yet, [https://www.washingtonpost.com/technology/2022/02/28/internet-war-cyber-russia-ukraine //](https://www.washingtonpost.com/technology/2022/02/28/internet-war-cyber-russia-ukraine%20//) JB]

For more than a decade, **military** commanders and outside experts have laid out blueprints for how cyberwar would unfold: military and civilian **networks** would be knocked **offline**, cutting-edge **software** would **sabotage power plants**, and whole populations would be unable to get money, gas or refrigerated **food**.

But while **Russia’s invasion** of Ukraine has spawned all manner of **cyberattacks** and defenses, few are playing out the way the experts thought they would.

As of Monday, five days after tanks moved into Ukraine, the **Internet** and other **key** Ukrainian infrastructure were still functioning, the outgunned Ukrainian military was still coordinating effectively and Russia’s vaunted disinformation capabilities were failing to persuade Ukrainians that resistance is futile.

“We imagined this orchestrated unleashing of violence in cyberspace, this ballet of attacks striking Ukraine in waves, and instead of that we have a brawl. And not even a very consequential brawl, just yet,” said Jason Healey, a former White House staffer for infrastructure protection and intelligence officer who’s now a research scholar on cyber conflict at Columbia University.

A vastly larger, more powerful military — one especially feared for its cyber-military prowess — has allowed Ukrainians almost unfettered access to the Internet. This has helped them get weapons to citizens and harness social media to rally global political support through direct, emotional appeals backed by stirring visuals.

“It’s certainly not what anyone predicted,” said Dmitri Alperovitch, a longtime cybersecurity executive and U.S. government adviser who heads Silverado Policy Accelerator.

[How Ukrainians have used social media to humiliate the Russians and rally the world](https://www.washingtonpost.com/technology/2022/03/01/social-media-ukraine-russia/?itid=lk_interstitial_manual_11)

Ukraine’s core cyberdefense has done better than expected because it focused on the issue after Russian hackers briefly knocked out power to swaths of the country in 2015 and 2016, said David Cowan, a veteran cybersecurity venture capitalist and corporate director, and because it has had help from American and European experts.

“I would have thought that by now Russia would have disabled a lot more infrastructure around communications, power and water,” Cowan said. “If Russia were attacking the U.S., there would be more cyber damage.”

The absence of major disruptions predicted by cyberwar doctrine has allowed Ukraine’s President Volodymyr Zelensky to deliver propaganda coups with little more than a smartphone and a data link. Images of civilian casualties, the brutal shelling of cities and also some Russian losses have undermined that nation’s claims of a limited and humane “special military operation.” A viral audio clip of Ukrainian soldiers on a tiny island telling a Russian warship to “go f--- yourself” has become a defining moment of national resistance.

“It’s become a global participatory thing. Everybody thinks they’re part of it,” said Doug Madory, director of Internet analysis for Kentik, which tracks global data flows. “It would be a lot harder to do all that if there was a blackout.”

Ukraine has not escaped unscathed, and some experts **warn** that cyberattacks or Internet outages could **grow** as Russia’s **invasion intensifies** in the face of unexpectedly stout resistance.

Russia or its allies already have deployed software to **wipe data off** some Ukrainian computers, including border control offices. But such intrusions are not nearly as widespread as in past attacks such as NotPetya, in which fake [ransomware](https://www.washingtonpost.com/business/2021/05/12/ransomware-attack/?itid=lk_inline_manual_21) attributed to the Russian government caused billions of dollars in damages, much of it in Ukraine.

#### Russian cyberattacks escalate and would win – escalation in multiple forums – goes global.

LIANA FIX 22 (Resident Fellow at the German Marshall Fund, in Washington, D.C). MICHAEL KIMMAGE (Professor of History at the Catholic University of America and a Visiting Fellow at the German Marshall Fund. )2/18/22, What If Russia Wins? A Kremlin-Controlled Ukraine Would Transform Europe, Foreign Affairs, <https://www.foreignaffairs.com/articles/ukraine/2022-02-18/what-if-russia-wins>

If Russia gains control of Ukraine or manages to destabilize it on a major scale, a new era for the United States and for Europe will begin. U.S. and European leaders would face the dual challenge of rethinking European security and of not being drawn into a larger war with Russia. All sides would have to consider the potential of nuclear-armed adversaries in direct confrontation. These two responsibilities—robustly defending European peace and prudently avoiding military escalation with Russia—will not necessarily be compatible. The United States and its allies could find themselves deeply unprepared for the task of having to create a new European security order as a result of Russia’s military actions in Ukraine.

MANY WAYS TO WIN

For Russia, victory in Ukraine could take various forms. As in [Syria](https://www.foreignaffairs.com/articles/syria/2016-03-20/russias-pyrrhic-victory-syria), victory does not have to result in a sustainable settlement. It could involve the installation of a compliant government in Kyiv or the partition of the country. Alternatively, the defeat of the Ukrainian military and the negotiation of a Ukrainian surrender could effectively transform Ukraine into a failed state. Russia could also employ devastating cyberattacks and disinformation tools, backed by the threat of force, to cripple the country and induce regime change. With any of these outcomes, Ukraine will have been effectively detached from the West.

If Russia achieves its political aims in Ukraine by military means, Europe will not be what it was before the war. Not only will U.S. primacy in Europe have been qualified; any sense that the European Union or NATO can ensure peace on the continent will be the artifact of a lost age. Instead, security in Europe will have to be reduced to defending the core members of the EU and NATO. Everyone outside the clubs will stand alone, with the exception of Finland and Sweden. This may not necessarily be a conscious decision to end enlargement or association policies; but it will be de facto policy. Under a perceived siege by Russia, the EU and NATO will no longer have the capacity for ambitious policies beyond their own borders.

The United States and Europe will also be in a state of permanent economic war with Russia. The West will seek to enforce sweeping sanctions, which Russia is likely to parry with cyber-measures and energy blackmailing, given the economic asymmetries. China might well stand on Russia’s side in this economic tit for tat. Meanwhile, domestic politics in European countries will resemble a twenty-first-century great game, in which Russia will be studying Europe for any breakdown in the commitment to NATO and to the transatlantic relationship. Through methods fair and foul, Russia will take whatever opportunity comes its way to influence public opinion and elections in European countries. Russia will be an anarchic presence—sometimes real, sometimes imagined—in every instance of European political instability.

Cold War analogies will not be helpful in a world with a Russianized Ukraine. The Cold War border in Europe had its flash points, but it was stabilized in a mutually acceptable fashion in the Helsinki Final Act of 1975. By contrast, Russian suzerainty over Ukraine would open a vast zone of destabilization and insecurity from Estonia to Poland to Romania to Turkey. For as long as it lasts, Russia’s presence in Ukraine will be perceived by Ukraine’s neighbors as provocative and unacceptable and, for some, as a threat to their own security. Amid this shifting dynamic, order in Europe will have to be conceived of in primarily military terms—which, since Russia has a stronger hand in the military than in the economic realm, will be in the Kremlin’s interest—sidelining nonmilitary institutions such as the European Union.

Russia has Europe’s largest conventional military, which it is more than ready to use. The EU’s defense policy—in contrast to NATO’s—is far from being able to provide security for its members. Thus will military reassurance, especially of the EU’s eastern members, be key. Responding to a revanchist Russia with sanctions and with the rhetorical proclamation of a rules-based international order will not be sufficient.

IMPERILING EUROPE'S EAST

In the event of a Russian victory in Ukraine, Germany‘s position in Europe will be severely challenged. Germany is a marginal military power that has based its postwar political identity on the rejection of war. The ring of friends it has surrounded itself with, especially in the east with Poland and the Baltic states, risks being destabilized by Russia. France and the United Kingdom will assume leading roles in European affairs by virtue of their comparatively strong militaries and long tradition of military interventions. The key factor in Europe, however, will remain the United States. NATO will depend on U.S. support as will the anxious and imperiled countries of Europe’s east, the frontline nations arrayed along a now very large, expanded, and uncertain line of contact with Russia, including Belarus and the Russian-controlled parts of Ukraine.

Eastern member states, including Estonia, Latvia, Lithuania, Poland, and Romania, will likely have substantial numbers of NATO troops permanently stationed on their soil. A request from Finland and Sweden to gain an Article 5 commitment and to join NATO would be impossible to reject. In Ukraine, EU and NATO countries will never recognize a new Russian-backed regime created by Moscow. But they will face the same challenge they do with Belarus: wielding sanctions without punishing the population and supporting those in need without having access to them. Some NATO members will bolster a Ukrainian insurgency, to which Russia will respond by threatening NATO members.

Ukraine’s predicament will be very great. Refugees will flee in multiple directions, quite possibly in the millions. And those parts of the Ukrainian military that are not directly defeated will continue fighting, echoing the partisan warfare that tore apart this whole region of Europe during and after World War II.

The permanent state of escalation between Russia and Europe may stay cold from a military perspective. It is likely, though, to be economically hot. The sanctions put on Russia in 2014, which were connected to formal diplomacy (often referred to as the “Minsk” process, after the city in which the negotiations were held), were not draconian. They were reversible as well as conditional. Following a Russian invasion of Ukraine, new sanctions on banking and on technology transfer would be significant and permanent. They would come in the wake of failed diplomacy and would start at “the top of the ladder,” according to the U.S. administration. In response, Russia will retaliate, quite possibly in the cyber-domain as well as in the energy sector. Moscow will limit access to critical goods such as titanium, of which Russia has been the world’s second-largest exporter. This war of attrition will test both sides. Russia will be ruthless in trying to get one or several European states to back away from economic conflict by linking a relaxation in tension to these countries’ self-interest, thus undermining consensus in the EU and NATO.

Europe’s strong suit is its economic leverage. Russia’s asset will be any source of domestic division or disruption in Europe or in Europe’s transatlantic partners. Here Russia will be proactive and opportunistic. If a pro-Russian movement or candidate shows up, that candidate can be encouraged directly or indirectly. If an economic or political sore point diminishes the foreign policy efficacy of the United States and its allies, it will be a weapon for Russian propaganda efforts and for Russian espionage.

Much of this is already happening. But a war in Ukraine will up the ante. Russia will use more resources and be unchained in its choice of instruments. The massive refugee flows arriving in Europe will exacerbate the EU’s unresolved refugee policy and provide fertile ground for populists. The holy grail of these informational, political, and cyberbattles will be the 2024 presidential election in the United States. Europe’s future will depend on this election. The election of Donald Trump or of a Trumpian candidate might destroy the transatlantic relationship at Europe’s hour of maximum peril, putting into question NATO’s position and its security guarantees for Europe.

TURNING NATO INWARD

For the United States, a Russian victory would have profound effects on its grand strategy in Europe, Asia, and the Middle East. First, Russian success in Ukraine would require Washington to pivot to Europe. No ambiguity about NATO’s Article 5 (of the kind experienced under Trump) will be permissible. Only a strong U.S. commitment to European security will prevent Russia from dividing European countries from one another. This will be difficult in light of competing priorities, especially those that confront the United States in a deteriorating relationship with China. But the interests at stake are fundamental. The United States has very large commercial equities in Europe. The European Union and the United States are each other’s largest trade and investment partners, with trade in goods and services totaling $1.1 trillion in 2019. A well-functioning, peaceful Europe augments American foreign policy—on climate change, on nonproliferation, on global public health, and on the management of tensions with China or Russia. If Europe is destabilized, then the United States will be much more alone in the world.

NATO is the logical means by which the United States can provide security reassurance to Europe and deter Russia. A war in Ukraine would revive NATO not as a democracy-building enterprise or as a tool for out-of-area expeditions like the war in Afghanistan but as the unsurpassed defensive military alliance that it was designed to be. Although Europeans will be demanding a greater military commitment to Europe from the United States, a broader Russian invasion of Ukraine should drive every NATO member to increase its defense spending. For Europeans, this would be the final call to improve Europe’s defensive capabilities—in tandem with the United States—in order to help the United States manage the Russian-Chinese dilemma.

For a Moscow now in permanent confrontation with the West, Beijing could serve as an economic backstop and a partner in opposing U.S. hegemony. In the worst case for U.S. grand strategy, China might be emboldened by Russia’s assertiveness and threaten confrontation over Taiwan. But there is no guarantee that an escalation in Ukraine will benefit the Sino-Russian relationship. China’s ambition to become the central node of the Eurasian economy will be damaged by war in Europe, because of the brutal uncertainties war brings. Chinese irritation with a Russia on the march will not enable a rapprochement between Washington and [Beijing](https://www.foreignaffairs.com/articles/china/competition-with-china-without-catastrophe), but it may initiate new conversations.

#### No limited nuclear wars – extinction.

Webber 19 – Dr Philip Webber has written widely on nuclear issues and is Chair of Scientists for Global Responsibility (SGR) – a membership organisation promoting responsible science and technology. We will all end up killing each other and one nuclear blast could do it. 5/18/19. [METRO.UK “We will all end up killing each other and one nuclear blast could do it,” <https://metro.co.uk/2019/05/18/we-will-all-end-up-killing-each-other-and-one-nuclear-blast-could-do-it-9370115/>] Recut Justin

The nuclear armed nations have inadvertently created a global Doomsday machine, built with 15,000 nuclear weapons.

Most (93%) have been built by Russia and in the US, 3,100 of them are ready to fire within hours.

Pre-programmed targets include main cities as well as a range of military and civilian targets across the world primarily in the UK, Europe, US, Russia and China but also in Japan, Australia and South America.

One nuclear blast, one mistake, one cyber attack could trigger it.

But first a reminder about the incredible destructive power of a nuclear weapon. Modern nuclear warheads are typically 20 times larger than either of the two bombs that obliterated Hiroshima and Nagasaki at the end of the Second World War. What just one nuclear warhead can do is unimaginable. We’ve drawn some of the key features to scale against cityscapes in the UK for a Russian SS-18 RS 20V (NATO designation ‘Satan’) 500kT warhead. US submarines deploy a similar weapon – the Trident II Mk5, 475kT warhead. A deafening, terrifying noise will be created, like an intense thunder that lasts for 10 seconds or longer.

After a blinding flash of light bright destroying the retina of anyone looking, and a violent electromagnetic pulse (EMP) knocking out electrical equipment several miles away, a bomb of this size quickly forms an incandescent fireball 850 metres across.

This is about the same height as the world’s tallest building, the Burj Khalifa. Drawn against the London Canary Wharf financial district or the Manchester skyline, the huge fireball dwarfs one Canary Sq. (240m), the South Tower Deansgate (201m) and the Beetham Tower Hilton, (170m). The fireball engulfs both city centres completely, melting glass and steel and forms an intensely radioactive 60m deep crater zone of molten earth and debris. A devastating supersonic blast wave flattens everything within a radius of two to three km, the entire Manchester centre, an area larger than the City of London, with lighter damage out to eight km. Most people in these areas would be killed or very seriously injured.

The fireball quickly rises forming an enormous characteristic mushroom shaped cloud raining highly radioactive particles (fallout). It rises to 60,000 ft (18,000m) – twice the altitude of Everest – and is 15 miles, 24km across.

This is one warhead. There are 10 such warheads on each of Russia’s 46 missiles (460 in total) and 48 on each of eight US Trident submarines (384 in total). In reality, in a nuclear conflict all of these warheads and a further 956 ready-to-fire are likely to be launched.

Whilst this scale of destruction is horrific and hundreds of millions of people would be killed in a few hours from a combination of blast, radiation and huge fires, there are also terrible longer-term effects.

Scientists predict that huge city-wide firestorms combined with very the high-altitude debris clouds would severely reduce sunlight levels and disrupt the world’s climate for a decade causing drought, a prolonged winter, global famine and catastrophic impacts for all life on earth and in the seas due to intense levels of UV with the destruction of the ozone layer.

#### Extinction outweighs

#### 1] Uncertainty – we don’t know which ethic is correct so we should default to staying alive to keep debating

#### 2] Magnitude– death is the finality and destroys all value and possible value for infinite future generations

#### 3] Reversibility – capitalism can be corrected in the future but extinction cannot

## 2

### OFF

#### Interpretation: Debaters must disclose broken constructive positions with underlining and highlighting on open source on the 2021-2022 NDCA LD wiki for every round they’ve debated this season.

#### Violation – they have open sourced nothing for the neg

#### 1] Debate resource inequities—you’ll say people will steal cards, but that’s good—only way to level the playing field for students like novices in under-privileged programs – key to inclusion and its an independent voter and outweighs because you can’t debate if you aren’t included

Antonucci 05 [Michael (Debate coach for Georgetown; former coach for Lexington High School); “[eDebate] open source? resp to Morris”; December 8; [http://www.ndtceda.com/pipermail/edebate/2005-December/064806.html //](http://www.ndtceda.com/pipermail/edebate/2005-December/064806.html%20//)] (no original tag) recut //Lex MS

Open source systems are preferable to the various punishment proposals in circulation. It's better to share the wealth than limit production or participation. Various flavors of argument communism appeal to different people, but banning interesting or useful research(ers) seems like the most destructive solution possible. Indeed, open systems may be the only structural, rule-based answer to resource inequities. Every other proposal I've seen obviously fails at the level of enforcement. Revenue sharing (illegal), salary caps (unenforceable and possibly illegal) and personnel restrictions (circumvented faster than you can say 'information is fungible') don't work. This would - for better or worse. b. With the help of a middling competent archivist, an open source system would reduce entry barriers. This is especially true on the novice or JV level. Young teams could plausibly subsist entirely on a diet of scavenged arguments. A novice team might not wish to do so, but the option can't hurt. c. An open source system would fundamentally change the evidence economy without targeting anyone or putting anyone out of a job. It seems much smarter (and less bilious) to change the value of a professional card-cutter's work than send the KGB after specific counter-revolutionary teams.

#### 2] Evidence ethics – open source is the only way to verify before round that cards aren’t mis cut – otherwise you could have highlighted or bracketed unethically. That’s an independent voter – maintaining ethical evidence practices is key to being good academics and to verify you didn’t cheat

#### 3] Depth of clash – open source allows debaters to come up with more nuanced researched objections to their opponents evidence before the round faster since it’s easier to read through the doc and see what parts of the evidence are actually highlighted. Leads to highest quality evidence comparison – outweighs – thinking on your feet is non-unique but the best quality responses will come from full access to a case.

#### Competing interps on theory – A] disclosing or not is a yes/no question, you can’t reasonably not disclose B] norm setting – reasonability is arbitrary and invites judge intervention C] reasonability causes a race to the bottom.

#### No RVIs: 1] Encourages theory baiting and chills checking real abuse. 2] Illogical b/c don’t win for being fair and logic is meta-constraint on arguments because it comes lexically prior.

#### DTD on disclosure – it indicts a practice not an argument and it deters them

## Case

### Adv 1

#### Collision risk is infinitesimally small

Fange 17 Daniel Von Fange 17, Web Application Engineer, Founder and Owner of LeanCoder, Full Stack, Polyglot Web Developer, “Kessler Syndrome is Over Hyped”, 5/21/2017, http://braino.org/essays/kessler\_syndrome\_is\_over\_hyped/

The orbital area around earth can be broken down into four regions. Low LEO - Up to about 400km. Things that orbit here burn up in the earth’s atmosphere quickly - between a few months to two years. The space station operates at the high end of this range. It loses about a kilometer of altitude a month and if not pushed higher every few months, would soon burn up. For all practical purposes, Low LEO doesn’t matter for Kessler Syndrome. If Low LEO was ever full of space junk, we’d just wait a year and a half, and the problem would be over. High LEO - 400km to 2000km. This where most heavy satellites and most space junk orbits. The air is thin enough here that satellites only go down slowly, and they have a much farther distance to fall. It can take 50 years for stuff here to get down. This is where Kessler Syndrome could be an issue. Mid Orbit - GPS satellites and other navigation satellites travel here in lonely, long lives. The volume of space is so huge, and the number of satellites so few, that we don’t need to worry about Kessler here. GEO - If you put a satellite far enough out from earth, the speed that the satellite travels around the earth will match the speed of the surface of the earth rotating under it. From the ground, the satellite will appear to hang motionless. Usually the geostationary orbit is used by big weather satellites and big TV broadcasting satellites. (This apparent motionlessness is why satellite TV dishes can be mounted pointing in a fixed direction. You can find approximate south just by looking around at the dishes in your northern hemisphere neighborhood.) For Kessler purposes, GEO orbit is roughly a ring 384,400 km around. However, all the satellites here are moving the same direction at the same speed - debris doesn’t get free velocity from the speed of the satellites. Also, it’s quite expensive to get a satellite here, and so there aren’t many, only about one satellite per 1000km of the ring. Kessler is not a problem here. How bad could Kessler Syndrome in High LEO be? Let’s imagine a worst case scenario. An evil alien intelligence chops up everything in High LEO, turning it into 1cm cubes of death orbiting at 1000km, spread as evenly across the surface of this sphere as orbital mechanics would allow. Is humanity cut off from space? I’m guessing the world has launched about 10,000 tons of satellites total. For guessing purposes, I’ll assume 2,500 tons of satellites and junk currently in High LEO. If satellites are made of aluminum, with a density of 2.70 g/cm3, then that’s 839,985,870 1cm cubes. A sphere for an orbit of 1,000km has a surface area of 682,752,000 square KM. So there would be one cube of junk per .81 square KM. If a rocket traveled through that, its odds of hitting that cube are tiny - less than 1 in 10,000.

#### Low risk of collisions – it’s overhyped

Albrecht 16 [Mark Albrecht, chairman of the board of USSpace LLC, head of the White House National Space Council from 1989 to 1992, and Paul Graziani, CEO and founder of Analytical Graphics, a company that develops software and provides mission assurance through the Commercial Space Operations Center (ComSpOC), Congested space is a serious problem solved by hard work, not hysteria, 2016, https://spacenews.com/op-ed-congested-space-is-a-serious-problem-solved-by-hard-work-not-hysteria/]

Popular culture has embraced the risks of collisions in space in films like Gravity. Some participants have dramatized the issue by producing graphics of Earth and its satellites, which make our planet look like a fuzzy marble, almost obscured by a dense cloud of white pellets meant to conceptualize space congestion. Unfortunately, for the sake of a good visual, satellites are depicted as if they were hundreds of miles wide, like the state of Pennsylvania (for the record, there are no space objects the size of Pennsylvania in orbit). Unfortunately, this is the rule, not the exception, and almost all of these articles, movies, graphics, and simulations are exaggerated and misleading. Space debris and collision risk is real, but it certainly is not a crisis. So what are the facts? On the positive side, space is empty and it is vast. At the altitude of the International Space Station, one half a degree of Earth longitude is almost 40 miles long. That same one half a degree at geostationary orbit, some 22,000 miles up is over 230 miles long. Generally, we don’t intentionally put satellites closer together than one-half degree. That means at geostationary orbit, they are no closer than 11 times as far as the eye can see on flat ground or on the sea: That’s the horizon over the horizon 10 times over. In addition, other than minute forces like solar winds and sparse bits of atmosphere that still exist 500 miles up, nothing gets in the way of orbiting objects and they behave quite predictably. The location of the smallest spacecraft can be predicated within a 1,000 feet, 24 hours in advance. Since we first started placing objects into space there have been 11 known low Earth orbit collisions, and three known collisions at geostationary orbit. Think of it: 135 space shuttle flights, all of the Apollo, Gemini and Mercury flights, hundreds of telecommunications satellites, 1,300 functioning satellites on orbit today, half a million total objects in space larger than a marble, and fewer than 15 known collisions. Why do people worry?

#### Uncertainty from debris collisions creates restraint not instability.

MacDonald 16, B., et al. "Crisis stability in space: China and other challenges." Foreign Policy Institute. Washington, DC (2016). (senior director of the Nonproliferation and Arms Control Project with the Center for Conflict Analysis and Prevention)//Elmer

In any crisis that threatens to escalate into major power conflict, political and military leaders will face uncertainty about the effectiveness of their plans and decisions. This uncertainty will be compounded when potential conflict extends to the space and cyber domains, where weapon effectiveness is largely untested and uncertain, infrastructure interdependencies are unclear, and damaging an adversary could also harm oneself or one’s allies. Unless the stakes become very high, no country will likely want to gamble its well-being in a “single cosmic throw of the dice,” in Harold Brown’s memorable phrase. 96 The novelty of space and cyber warfare, coupled with risk aversion and worst-case assessments, could lead space adversaries into a situation of what can be called “hysteresis,” where each adversary is restrained by its own uncertainty of success. This is conceptually shown in Figures 1 and 2 for offensive counter-space capabilities, though it applies more generally. 97 These graphs portray the hypothetical differences between perceived and actual performance capabilities of offensive counter-space weapons, on a scale from zero to one hundred percent effectiveness. Where uncertainty and risk aversion are absent for two adversaries, no difference would exist between the likely performance of their offensive counter-space assets and their confidence in the performance of those weapons: a simple, straight-line correlation would exist, as in Figure 1. The more interesting, and more realistic, case is notionally presented in Figure 2, which assumes for simplicity that the offensive capabilities of each adversary are comparable. In stark contrast to the case of Figure 1, uncertainty and risk aversion are present and become important factors. Given the high stakes involved in a possible large-scale attack against adversary space assets, a cautious adversary is more likely to be conservative in estimating the effectiveness of its offensive capabilities, while more generously assessing the capabilities of its adversary.

#### No Escalation over Satellites:

#### 1] Planning Priorities

Bowen 18 Bleddyn Bowen 2-20-2018 “The Art of Space Deterrence” <https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/> (Lecturer in International Relations at the University of Leicester)//Elmer

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.

#### 2] Military Precedent

Zarybnisky 18, Eric J. Celestial Deterrence: Deterring Aggression in the Global Commons of Space. Naval War College Newport United States, 2018. (Senior Materiel Leader at United States Air Force)//Elmer

PREVENTING AGGRESSION IN SPACE While deterrence and the Cold War are strongly linked in the public’s mind through the nuclear standoff between the United States and the Soviet Union, the fundamentals of deterrence date back millennia and deterrence remains relevant. Thucydides alludes to the concept of deterrence in his telling of the Peloponnesian War when he describes rivals seeking advantages, such as recruiting allies, to dissuade an adversary from starting or expanding a conflict.6F 6 Aggression in space was successfully avoided during the Cold War because both sides viewed an attack on military satellites as highly escalatory, and such an action would likely result in general nuclear war.7F 7 In today’s more nuanced world, attacking satellites, including military satellites, does not necessarily result in nuclear war. For instance, foreign countries have used highpowered lasers against American intelligence-gathering satellites8F 8 and the United States has been reluctant to respond, let alone retaliate with nuclear weapons. This shift in policy is a result of the broader use of gray zone operations, to which countries struggle to respond while limiting escalation. Beginning with the fundamentals of deterrence illuminates how it applies to prevention of aggression in space.

### Adv 2

#### 1] No impact uniqueness - no articulation of how neoliberalism will cause extinction or is on the brink - it's nonunique at best because we've operated under capitalism for so long but we're alive

#### 2] We don't need to win capitalism is good, just that it's better than the alternatives which they haven't given – the advantage is nonunique because it doesn’t solve neolib on eart – cx should frame that

#### 3] Colonization of outer space is essential to humanity – 5 warrants

Orwig 15 [(Jessica, a senior editor at Insider. She has a Master of Science in science and technology journalism from Texas A&M University and a Bachelor of Science in astronomy and physics from The Ohio State University. Before NY she spent time as an intern at: American Physical Society in MD International Center for Theoretical Physics in Italy Fermi National Accelerator Laboratory in IL American Geophysical Union in DC), “5 undeniable reasons humans need to colonize Mars — even though it's going to cost billions,” Slate, 4/21/2015, https://www.businessinsider.com/5-undeniable-reasons-why-humans-should-go-to-mars-2015-4] MN

Establishing a permanent colony of humans on Mars is not an option. It's a necessity. At least, that's what some of the most innovative, intelligent minds of our age — Buzz Aldrin, Stephen Hawking, Elon Musk, Bill Nye, and Neil deGrasse Tyson — are saying. Of course, it's extremely difficult to foresee how manned missions to Mars that would cost hundreds of billions of dollars each, could benefit mankind. It's easier to imagine how that kind of money could immediately help in the fight against cancer or world hunger. That's because humans tend to be short-sighted. We're focused on what's happening tomorrow instead of 100 years from now. "If the human race is to continue for another million years, we will have to boldly go where no one has gone before," Hawking said in 2008 at a lecture series for NASA's 50th anniversary. That brings us to the first reason humans must colonize Mars: 1. Ensuring the survival of our species The only home humans have ever known is Earth. But history shows that surviving as a species on this tiny blue dot in the vacuum of space is tough and by no means guaranteed. The dinosaurs are a classic example: They roamed the planet for 165 million years, but the only trace of them today are their fossilized remains. A colossal asteroid wiped them out. Putting humans on more than one planet would better ensure our existence thousands if not millions of years from now. "Humans need to be a multiplanet species," Musk recently told astronomer and Slate science blogger Phil Plait. Musk founded the space transport company SpaceX to help make this happen. Mars is an ideal target because it has a day about the same length as Earth's and water ice on its surface. Moreover, it's the best available option: Venus and Mercury are too hot, and the Moon has no atmosphere to protect residents from destructive meteor impacts. 2. Discovering life on Mars Nye, the CEO of The Planetary Society, said during an episode of StarTalk Radio in March that humanity should focus on sending humans instead of robots to Mars because humans could make discoveries 10,000 times as fast as the best spacecraft explorers we have today. Though he was hesitant to say humans should live on Mars, he agreed there were many more discoveries to be made there. One monumental discovery scientists could make is determining whether life currently exists on Mars. If we're going to do that, we'll most likely have to dig much deeper than NASA's rovers can. The theory there is that life was spawned not from the swamps on adolescent Earth, but from watery chasms on Mars. The Mars life theory suggests that rocks rich with microorganisms could have been ejected off the planet's surface from a powerful impact, eventually making their way through space to Earth. It's not a stretch to imagine, because Martian rocks can be found on Earth. None of those, however, have shown signs of life. "You cannot rule out the fact that a Mars rock with life in it landing on the Earth kicked off terrestrial life, and you can only really test that by finding life on Mars," Christopher Impey, a British astronomer and author of over a dozen books in astronomy and popular science, told Business Insider. 3. Improving the quality of life on Earth "Only by pushing mankind to its limits, to the bottoms of the ocean and into space, will we make discoveries in science and technology that can be adapted to improve life on Earth." British doctor Alexander Kumar wrote that in a 2012 article for BBC News where he explored the pros and cons of sending humans to Mars. At the time, Kumar was living in the most Mars-like place on Earth, Antarctica, to test how he adapted to the extreme conditions both physiologically and psychologically. To better understand his poignant remark, let's look at an example: During its first three years in space, NASA's prized Hubble Space Telescope snapped blurry pictures because of a flaw in its engineering. The problem was fixed in 1993, but to try to make use of the blurry images during those initial years, astronomers developed a computer algorithm to better extract information from the images. It turns out the algorithm was eventually shared with a medical doctor who applied it to the X-ray images he was taking to detect breast cancer. The algorithm did a better job at detecting early stages of breast cancer than the conventional method, which at the time was the naked eye. "You can't script that. That happens all the time — this cross pollination of fields, innovation in one, stimulating revolutionary changes in another," Tyson, the StarTalk radio host, explained during an interview with Fareed Zakaria in 2012. It's impossible to predict how cutting-edge technologies used to develop manned missions to Mars and habitats on Mars will benefit other fields like medicine or agriculture. But we'll figure that out only by "pushing humankind to its limits" and boldy going where we've never been before. 4. Growing as a species Another reason we should go to Mars, according to Tyson, is to inspire the next generation of space explorers. When asked in 2013 whether we should go to Mars, he answered: "Yes, if it galvanizes an entire generation of students in the educational pipeline to want to become scientists, engineers, technologists, and mathematicians," he said. "The next generation of astronauts to land on Mars are in middle school now." Humanity's aspirations to explore space are what drive us toward more advanced technological innovations that will undoubtedly benefit mankind in one way or another. "Space is like a proxy for a lot of what else goes on in society, including your urge to innovate," Tyson said during his interview with Zakaria. He added: "There's nothing that drives ambitions the way NASA does." 5. Demonstrating political and economic leadership At a February 24 hearing, Aldrin told the US Senate's Subcommittee on Space, Science and Competitiveness that getting to Mars was a necessity not only for science, but also for policy. "In my opinion, there is no more convincing way to demonstrate American leadership for the remainder of this century than to commit to a permanent presence on Mars," he said. If Americans do not go to Mars, someone else will. And that spells political and economic benefit for whoever succeeds. "If you lose your space edge," Tyson said during his interview with Zakaria, "my deep concern is that you lose everything else about society that enables you to compete economically."

#### 4] Space col key to innovation

West 20 Darrell M. West, 8-18-2020, "Five reasons to explore Mars," Brookings, <https://www.brookings.edu/blog/techtank/2020/08/18/five-reasons-to-explore-mars/> TDI

The recent launch of the Mars rover Perseverance is the latest U.S. space mission seeking to understand our solar system. Its [expected arrival at the Red Planet in mid-February](https://www.nytimes.com/2020/07/30/science/nasa-mars-launch.html) 2021 has a number of objectives linked to science and innovation. The rover is equipped with sophisticated instruments designed to search for the remains of ancient microbial life, take pictures and videos of rocks, drill for soil and rock samples, and use a small helicopter to fly around the [Jezero Crater landing spot](https://mars.nasa.gov/resources/22474/jezero-crater-mars-2020s-landing-site/). Mars is a valuable place for exploration because it can be reached in 6 ½ months, is a major opportunity for scientific exploration, and has been mapped and studied for several decades. The mission represents the first step in a long-term effort to bring Martian samples back to Earth, where they can be analyzed for residues of microbial life. Beyond the study of life itself, there are a number of different benefits of Mars exploration. UNDERSTAND THE ORIGINS AND UBIQUITY OF LIFE The site where Perseverance is expected to land is the place where experts believe 3.5 billion years ago held a lake filled with water and flowing rivers. It is an ideal place to search for the residues of microbial life, test new technologies, and lay the groundwork for human exploration down the road. The mission plans to investigate whether microbial life existed on Mars billions of years ago and therefore that life is not unique to Planet Earth. As noted by Chris McKay, a research scientist at NASA’s Ames Research Science Center, that would be an extraordinary discovery. “Right here in our solar system, [if life started twice](https://www.space.com/9329-earth-unique-life-common-universe.html), that tells us some amazing things about our universe,” he pointed out. “It means the universe is full of life. Life becomes a natural feature of the universe, not just a quirk of this odd little planet around this star.” The question of the origins of life and its ubiquity around the universe is central to science, religion, and philosophy. For much of our existence, humans have assumed that even primitive life was unique to Planet Earth and not present in the rest of the solar system, let alone the universe. We have constructed elaborate religious and philosophical narratives around this assumption and built our identity along the notion that life is unique to Earth. If, as many scientists expect, future space missions cast doubt on that assumption or outright disprove it by finding remnants of microbial life on other planets, it will be both invigorating and illusion-shattering. It will force humans to confront their own myths and consider alternative narratives about the universe and the place of Earth in the overall scheme of things. As noted in my Brookings book, [Megachange](https://www.brookings.edu/book/megachange-economic-disruption-political-upheaval-and-social-strife-in-the-21st-century/), given the centrality of these issues for fundamental questions about human existence and the meaning of life, it would represent a far-reaching shift in existing human paradigms. As argued by scientist McKay, discovering evidence of ancient microbial life on Mars would lead experts to conclude that life likely is ubiquitous around the universe and not limited to Planet Earth. Humans would have to construct new theories about ourselves and our place in the universe. DEVELOP NEW TECHNOLOGIES The U.S. space program has been an extraordinary [catalyst for technology innovation](https://www.jpl.nasa.gov/infographics/infographic.view.php?id=11358). Everything from Global Positioning Systems and medical diagnostic tools to wireless technology and camera phones owe at least part of their creation to the space program. Space exploration required the National Aeronautics and Space Administration to learn how to communicate across wide distances, develop precise navigational tools, store, transmit, and process large amounts of data, deal with health issues through digital imaging and telemedicine, and develop collaborative tools that link scientists around the world. The space program has pioneered the miniaturization of scientific equipment and helped engineers figure out how to land and maneuver a rover from millions of miles away. Going to Mars requires similar inventiveness. Scientists have had to figure out how to search for life in ancient rocks, drill for rock samples, take high resolution videos, develop flying machines in a place with gravity that is 40 percent lower than on Earth, send detailed information back to Earth in a timely manner, and take off from another planet. In the future, we should expect large payoffs in commercial developments from Mars exploration and advances that bring new conveniences and inventions to people. ENCOURAGE SPACE TOURISM In the not too distant future, wealthy tourists likely will take trips around the Earth, visit space stations, orbit the Moon, and perhaps even take trips around Mars. For a substantial fee, they can experience weightlessness, take in the views of the entire planet, see the stars from outside the Earth’s atmosphere, and witness the wonders of other celestial bodies. The Mars program will help with space tourism by improving engineering expertise with space docking, launches, and reentry and providing additional experience about the impact of space travel on the human body. Figuring out how weightlessness and low gravity situations alter human performance and how space radiation affects people represent just a couple areas where there are likely to be positive by-products for future travel. The advent of space tourism will [broaden human horizons](https://unitedearth.us/religion-and-spirituality/does-seeing-earth-from-space-alter-your-perspective/) in the same way international travel has exposed people to other lands and perspectives. It will show them that the Earth has a delicate ecosystem that deserves protecting and why it is important for people of differing countries to work together to solve global problems. Astronauts who have had this experience say it has altered their viewpoints and had a profound impact on their way of thinking. FACILITATE SPACE MINING Many objects around the solar system are made of similar minerals and chemical compounds that exist on Earth. That means that some asteroids, moons, and planets could be rich in minerals and rare elements. Figuring out how to [harvest those materials](https://www.sciencefocus.com/space/space-mining-the-new-goldrush/) in a safe and responsible manner and bring them back to Earth represents a possible benefit of space exploration. Elements that are rare on Earth may exist elsewhere, and that could open new avenues for manufacturing, product design, and resource distribution. This mission could help resource utilization through advances gained with its Mars Oxygen Experiment (MOXIE) equipment that converts Martian carbon dioxide into oxygen. If MOXIE works as intended, it would help humans live and work on the Red Planet. ADVANCE SCIENCE One of the most crucial features of humanity is our curiosity about the life, the universe, and how things operate. Exploring space provides a means to satisfy our thirst for knowledge and improve our understanding of ourselves and our place in the universe. Space travel already has exploded centuries-old myths and promises to continue to confront our long-held assumptions about who we are and where we come from. The next decade promises to be an exciting period as scientists mine new data from space telescopes, space travel, and robotic exploration. Ten or twenty years from now, we may have [answers to basic questions](https://www.brookings.edu/book/turning-point/) that have eluded humans for centuries, such as how ubiquitous life is outside of Earth, whether it is possible for humans to survive on other planets, and how planets evolve over time.

#### 5] Space colonization encourages healthcare innovations- solves diseases

Donoviel 19 (Dorit Donoviel, 7-19-2019, "Space exploration is reinventing healthcare," [20+ years leadership experience as executive director of R&D overseeing diverse areas of biomedical research from basic to applied science, drug discovery, and technology development. Executing a multi-million dollar national research portfolio of grants addressing the plethora of physiological and behavioral challenges of humans in space. Executive Director, Translational Research Institute for Space Health at Baylor College of Medicine] The Hill, <https://thehill.com/opinion/technology/453853-space-exploration-is-reinventing-healthcare>) TDI

Though many do not realize it, humans have been living and working in space continuously for the past two decades. The conditions of spaceflight have accelerated our ability to study progressive degenerative diseases. This novel paradigm of understanding human physiology under the stresses of living in space holds great promise for new sources of medical breakthroughs for Earth. Although astronauts are carefully selected to be exceptionally healthy and exhibit peak physical and mental performance, after only four to six months in space, they can develop numerous medical [conditions](https://humanresearchroadmap.nasa.gov/Risks/). Without appropriate exercise, they lose bone and muscle mass. They become prone to developing kidney stones. Their hearts become deconditioned. Their blood vessels stiffen. A subset of astronauts develop a swelling of the optic nerve and possibly an increase in pressure on the brain. Even dormant viruses become activated, alongside changes to the immune system. There is a sense of urgency to solve these problems if we are to send humans to Mars and return them safely in the next decade or two. This is why NASA is investing in cutting-edge research for human health and performance including high-risk high-reward approaches funded through the [Translational Research institute for Space Health](https://www.bcm.edu/centers/space-medicine/translational-research-institute) (TRISH). Supporting potentially ground-breaking innovations requires a leap of faith in the right direction. Keeping astronauts healthy during deep space exploration missions — where there are no hospitals and no medical specialists — requires a different paradigm for healthcare. Astronauts are typically engineers and scientists, and only occasionally physicians. On the way to Mars, when communications with Earth will be limited, they could be forced to act as both patients and healthcare providers. If a medical condition is allowed to progress when they are millions of miles away from Earth, the situation could become catastrophic. Therefore, astronauts will need to detect even the most subtle changes in their own health status early enough to prevent disease. This requires a healthcare paradigm of predicting, preventing and mitigating ailments by intervening early. This means enabling monitoring, diagnostic and therapeutic medical capabilities that are simple to use, safe, robust and miniaturized. Additionally, what will work in a small spacecraft in the hands of an engineer is also likely to work in a community clinic with limited resources. Or even in our homes. This different approach to healthcare can help save lives and reduce costs — at a global level. Space demands the best in healthcare innovations, focusing on prevention and early intervention using smart, creative solutions. On a mission to Mars, blood tests will be done in a matter of minutes, by the patient, on a single [drop of blood](https://www.1dropdx.com/). A trained and adaptive computer [algorithm](https://www.visualdx.com/) will track health status based on a variety of physiological parameters and alert astronauts when important deviations from normal become evident. [Automated eye exams](https://www.healio.com/ophthalmology/retina-vitreous/news/online/%7Bb1a85e81-9e54-4976-9717-3218fd7fa175%7D/web-vision-technologies-awarded-grants-to-develop-devices-for-nasa) will be performed by the astronauts on themselves and images will be analyzed by a computer for changes. Customized [medications](http://news.mit.edu/2016/portable-pharmacy-on-demand-0331) will be tailor-made for the patient on the spot. If a minor medical procedure is required, the caregiver will learn and practice beforehand using augmented reality tools and software [simulations](https://www.level-ex.com/) adjusted for zero-gravity. Kidney stones will be found early and treated quickly and painlessly using [ultrasound](http://www.sonomotion.com/) to “push” them out of the kidney so they can be cleared naturally with urination. Sleep and mood will be improved using [sound stimulation](https://www.usa.philips.com/a-w/about/news/archive/standard/news/press/2019/20190617-philips-smartsleep-deep-sleep-headband-selected-by-nasa-funded-institute-for-studies-to-improve-sleep-and-behavioral-health.html) and health will be improved by individualized diets which will be enriched with high-nutrient [plants](https://news.ucr.edu/articles/2019/04/25/astronauts-might-soon-grow-space-tomatoes) grown efficiently within a small footprint. Most importantly, all these advances have clear and important applications on Earth. Space exploration has already yielded hundreds of inventions that filled our [arsenal](https://spinoff.nasa.gov/) for fighting diseases. To land women and men on Mars and return them healthy, we must reinvent healthcare. The positive consequences of this work will impact all of humanity. The spirit of Apollo is alive and well in space health research today. And for science, medicine and technology pioneers, our most important work is still ahead.

#### 6] Colonies in space are sustainable and rely on planetary resources

Haynes 19, 5/17, Korey "O’Neill colonies: A decades-long dream for settling space," Astronomy, https://astronomy.com/news/2019/05/oneill-colonies-a-decades-long-dream-for-settling-space Top of Form

Bottom of Form

Last week, Amazon founder Jeff Bezos revealed his spaceship company’s new lunar lander, dubbed Blue Moon, and he spelled out a bold and broad vision for humanity’s future in space. Faced with the limits of resources here on Earth, most fundamentally energy, he pointed to life in space as a solution. “If we move out into the solar system, for all practical purposes, we have unlimited resources,” Bezos said. “We could have a trillion people out in the solar system.” And while colonies on other planets would be plagued by low gravity, long distances to Earth (leading to communication delays), and further limits down the road, those weaknesses are avoided if the colonies remain truly in space. To that end, Bezos instead suggested people consider taking up residence in O’Neill colonies, a futuristic concept for space settlements first dreamed up decades ago. “These are very large structures, miles on end, and they hold a million people or more each.” Gerard O’Neill was a physicist from Princeton University who teamed up with NASA in the 1970s on a series of workshops that explored efficient ways for humans to live off-world. Beyond influencing Bezos, his ideas have also deeply affected how many space experts and enthusiasts think about realistic ways of living in space. “What will space colonies be like?” O’Neill once asked the Space Science Institute he founded. “First of all, there’s no point in going out into space if the future that we see there is a sterile future of living in tin cans. We have to be able to recreate, in space, habitats which are as beautiful, as Earth-like, as the loveliest parts of planet Earth — and we can do that.” Of course, neither O’Neill nor anyone since has actually made such a habitat, but in many ways, the concepts he helped developed half a century ago remain some of the most practical options for large-scale and long-term space habitation. While NASA has mostly focused on exploring the moon and Mars in recent years, O’Neill colonies offer an option untethered to any planetary body. Instead, people would live in enormous circular structures in space that would be capable of hosting many thousands of people — or even millions according to Bezos — on a permanent basis. You may have seen these kinds of colonies in science fiction, from Star Trek, to the movie Interstellar. But in real life, researchers have thought up a a few variations: either a sphere, a cylinder, or a ring-shaped torus. All of these are designed to rotate and create a centrifugal force that mimics gravity for the inhabitants. While the sizes and specifications of the colonies vary, there are a few staples. In general, O’Neill colonies were designed to be permanent, self-sustaining structures. That means they would use solar power for electrical energy and for growing crops. The outer walls of an O’Neill colony are generally pictured as a transparent material, so that mirrors can aim sunlight through its walls as needed to provide light and energy – or to allow darkness, a feature humans also need, especially while we sleep. But building these colonies is a challenge beyond any humans have accomplished so far in space, and Bezos acknowledged that. He referred to two “gates” in his announcement, which he clarified as challenges that humans need to overcome. The first, which his company Blue Origin and other space entrepreneurs have been tackling, is to reduce the cost and difficulty of getting to space at all. But the second involves using resources from space, rather than hauling them from Earth. Bezos isn’t alone in such thinking. Most of NASA’s long-term plans for the Moon and Mars involve rely on harvesting materials and manufacturing products locally, using lunar and martian regolith to build and repair structures. And in the shorter term, three of the dozen experiments NASA selected as the first to fly as part of the new lunar program — possibly even by the end of the year — are what NASA terms “resource prospecting instruments.” That pairs well with O’Neill’s vision. These colonies are meant to use resources gathered from space, whether asteroids, the Moon, or even Mars. Doing so avoids the costly effort of heaving materials and goods out of Earth’s deep gravity well. That means they would be built using materials available cheaply in space. The humans and their attendant plants and animals would need to be carried from Earth. But raw materials like oxygen, nitrogen and aluminum are plentiful in the solar system, and mining for resources in space is a common theme across space settlement discussions. Because of their size, the colonies should be able to act as fully independent ecosystems, with plants to cycle air and water and resource cycles not so dissimilar from Earth. Humans are a long way from being able to launch anything like an O’Neill colony in the near future. But it’s somewhat telling that, after 50 years of space exploration and technological achievement, one of the modern leaders in private spaceflight is still espousing an idea from the first days of space exploration.

#### 7] Specificity flows neg – the terminal impact of the advantage is only a small increase of capitalism that just causes commodification but death outweighs

### Solvency

#### OST Fails

**Evanoff 17** [Kyle Evanoff, Kyle is a research associate in international economics and U.S. foreign policy at the Council on Foreign Relations 10/10/17, "The Outer Space Treaty’s Midlife Funk," Council on Foreign Relations [https://www.cfr.org/blog/outer-space-treatys-midlife-funk accessed 12/11/2021](https://www.cfr.org/blog/outer-space-treatys-midlife-funk%20accessed%2012/11/2021)] Adam

Half a century later, however, the Outer Space Treaty has entered something of a funk. Despite the universal aspirations of the UN Committee on the Peaceful Uses of Outer Space, which molded the document into its completed form, many of the principles enshrined within the text are less suited to the present than they were to their native Cold War milieu. While the anachronism has not reached crisis levels, current and foreseeable developments do present challenges for the treaty, heightening the potential for disputes. At the crux of the matter is the ongoing democratization of space. During the 1950s and ‘60s, when the fundamental principles of international space law took shape, only large national governments could afford the enormous outlays required for creating and maintaining a successful space program. In more recent decades, technological advances and new business models have broadened the range of spacefaring actors. Thanks to innovations such as reusable rockets, micro- and nanosatellites, and inflatable space station modules, costs are decreasing and private companies are crowding into the sector. This flurry of activity, known as New Space, promises nothing less than a complete transformation of the way that humans interact with space. Asteroid mining, for example, could eliminate the need to launch many essential materials from Earth, lowering logistical hurdles and enabling largescale in-space fabrication. Companies like Planetary Resources and Deep Space Industries, by extracting and selling useful resources in situ, could help to jumpstart a sustainable space economy. They might also profit from selling valuable commodities back on terra firma. As a recent (bullish) Goldman Sachs report noted, a single football-field-sized asteroid could contain $25 to $50 billion worth of platinum—enough to upend the terrestrial market. With astronomical sums at stake and the commercial sector kicking into high gear, legal questions are becoming a major concern. Many of these questions focus on Article II of the Outer Space Treaty, which prohibits national appropriation of space and the celestial bodies. Since another provision (Article VI) requires nongovernmental entities to operate under a national flag, some experts have suggested that asteroid mining, which would require a period of exclusive use, may violate the agreement. Others, however, contend that companies can claim ownership of extracted resources without claiming ownership of the asteroids themselves. They cite the lunar samples returned to Earth during the Apollo program as a precedent. Hoping to promote American space commerce, Congress formalized this more charitable legal interpretation in Title IV of the 2015 U.S. Commercial Space Launch Competitiveness Act. Luxembourg, which announced a €200 million asteroid mining fund last year, followed suit with its own law in August. Controversies like the one surrounding asteroid mining are par for the course when it comes to the Outer Space Treaty. The agreement’s insistence that space be used “for peaceful purposes” has long been the subject of intense debate. During the treaty-making process, Soviet jurists argued that peaceful meant “non-military” and that spy satellites were illegal; Americans, who enjoyed an early lead in orbital reconnaissance, interpreted peaceful to mean “non-aggressive” and came to the opposite conclusion. Decades later, the precise meaning of the phrase remains a matter of contention. While the Outer Space Treaty has survived past disputes intact, some experts and policymakers believe that an update is in order. Senator Ted Cruz (R-TX), for instance, worries that legal ambiguity could undermine the nascent commercial space sector—a justifiable concern. Russia and Brazil, among other countries, hold asteroid mining operations to constitute de facto national appropriation. And while there are plenty of asteroids to go around for now (NASA has catalogued nearly 8,000 near earth objects larger than 140 meters in diameter), more supply-side saturation could lead to conflicts over choice space rocks. The absence of clear property rights makes this prospect all the more likely. Plans to establish outposts on the moon and Mars present a bigger challenge still. Last week, prior to the first meeting of the revived National Space Council, Vice President Mike Pence described the need for “a renewed American presence on the moon, a vital strategic goal” in an op-ed for the Wall Street Journal. His piece came on the heels of SpaceX Founder and Chief Executive Officer Elon Musk’s announcement at the 2017 International Astronautical Congress of a revised plan to colonize the red planet, with the first human missions slated for 2024. Musk hopes for the colony to house one million inhabitants within the next fifty years. While mining might require only temporary use of the celestial bodies, full-fledged colonies would necessarily be more permanent affairs. With some national governments arguing that mining operations would constitute territorial claims, lunar and Martian bases are almost certain to enter the legal crosshairs. And, even under the favorable U.S. interpretation of the Outer Space Treaty, states and private companies would need to avoid making territorial claims. If viable colony locations are relatively few and far between, fierce competition could make asserting control a practical necessity. Even so, policymakers should avoid hasty attempts to overhaul the Outer Space Treaty. The uncertainties associated with altering the fundamental principles of international space law are greater than any existing ambiguities. Commercial spacefaring already entails high levels of risk; adding new regulatory hazards to the mix would jeopardize investment and could slow progress in the sector. While the current property rights regime may be untenable over longer timelines, it remains workable for now.