# 1NC-round2-stanford

## 1

#### I value morality, the standard is consistency with consequentialism.

#### 1] only it can explain degrees of wrongness- it is worse to kill thousands than to lie to a friend- either ethical theories cannot explain comparative badness, or it collapses

#### 2] actor spec-

#### A] no act-omission or intent-foresight distinction- gov’ts must create permissions and prohibitions so inaction is functionally an action and policymakers have to take the global perspective since they are responsible for the public and lack the relevant features of individual agents like autonomy that justify such a distinction

#### B] gov’ts have to aggregate since all collective actions require trade-offs that benefit some and worsen others- side-constraints freeze action and render ethics inoperable- takes-out and turns calc indicts- consequentialism is hard but not impossible, it’s empirically false since we calculate all the time, and the alt is no action which is worse

#### 4] existential threats outweigh- extinction o/ws under any framework- moral uncertainty and future gens

Pummer 15 — (Theron Pummer, Junior Research Fellow in Philosophy at St. Anne's College, University of Oxford, “Moral Agreement on Saving the World“, Practical Ethics University of Oxford, 5-18-2015, Available Online at http://blog.practicalethics.ox.ac.uk/2015/05/moral-agreement-on-saving-the-world/, accessed 7-2-2018, HKR-AM) \*\*we do not endorse ableist language=

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people. Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake. Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don’t matter. Even John Rawls wrote, “All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.” Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view. They’d thus imply very strong reasons to reduce existential risk, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk. It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. We should also take into account moral uncertainty. What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I’ve just argued that there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world. Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, all minimally plausible moral views would converge on the conclusion that we should try to save the world. While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.” (From chapter 36 of On What Matters)

## 2

#### Congress is inching towards a funding deal—but, it’s a deliberate dance to keep them focused on funding while avoiding political complications

Romm 2/2 [Tony Romm is the congressional economic policy reporter at The Washington Post, tracking infrastructure reform, government spending and the financial impacts of federal decision-making nationwide, "Democrats, GOP inch ahead toward potential deal to fund government, avert shutdown", 2/2/22, https://www.washingtonpost.com/us-policy/2022/02/02/democrats-republicans-spending-shutdown-covid/]

Top Democrats and Republicans inched forward Wednesday in pursuit of a deal that could fund the federal government for the remainder of the fiscal year, hoping to stave off a shutdown while potentially pumping new spending into health care, education, science and defense.

The continued negotiations marked the second consecutive day of developments on Capitol Hill, as lawmakers who oversee the federal purse increasingly have come to express a measure of confidence that they can act before an upcoming Feb. 18 deadline — and overcome months of prior political disputes and delays.

Since President Biden took office, the U.S. government has operated under short-term measures that sustain key federal agencies and programs largely at their existing spending levels. The stopgaps have kept the government running, but they have also delayed Democrats from delivering on some of the White House’s top priorities, from expanding affordable housing to confronting climate change.

Republicans appeared content to continue in that vein, essentially dealing a political blow to Biden’s agenda in the process. But the two sides have come to see mutual benefit in striking a longer-term resolution, putting aside their differences at a moment when the United States continues to confront the pandemic at home and faces new diplomatic challenges abroad. The omicron variant of the coronavirus has sparked fresh discussions about the need for another round of federal aid, while the intensifying standoff between Russia and Ukraine has emboldened a Republican-led push to spend more on defense.

Both spending priorities could be appended to any new government funding measure, provided the two sides can reach a deal in the first place. In a sign of progress, Republicans on Wednesday presented a counter-offer for federal spending over the rest of the 2022 fiscal year, which Democrats are reviewing. The GOP move had the effect of temporarily delaying a planned afternoon meeting of the House and Senate’s top appropriators, but it still reflected a new seriousness among negotiators who until now hadn’t traded such proposals.

Yet new political fault lines also emerged Wednesday. Taking to the chamber floor earlier in the day, Senate Minority Leader Mitch McConnell (R-Ky.) foreshadowed what could be staunch GOP opposition to another round of pandemic relief, as he cited roughly $6 trillion in spending that has been approved since the start of the public health emergency in 2020.

“Let’s start the discussion by talking about repurposing the hundreds of billions already sitting in the pipeline,” McConnell said.

Lawmakers begin discussing government spending deal as Democrats eye virus aid, paid leave

The promises and platitudes nonetheless amounted to noteworthy progress on Capitol Hill, a place where partisan disagreements these days have come to transform all but the most basic debates into intractable conflicts.

Twice in recent months, the appropriations process has nearly brought federal agencies to a screeching halt, threatening to shut down the government and hamstring the country’s response to the pandemic. Republicans at the end of last year even held up a swift resolution to the funding fight to launch an ill-fated political campaign against Biden’s vaccination and testing mandates targeting businesses. The Supreme Court later struck down some of the administration’s policies.

This year, lawmakers from both parties have pledged to steer clear of the same brinkmanship that characterized negotiations in fights past. Instead they have aimed for a deal that covers spending through the fiscal year, which concludes at the end of September. But they already face a race against the clock to act by Feb. 18, the date by which lawmakers must adopt another short-term measure or broker the sort of compromise that has so far eluded them during Biden’s presidency.

With the clock ticking, Democrats huddled Tuesday morning to discuss their political strategy. Emerging from the gathering, House Speaker Nancy Pelosi (D-Calif.) and Senate Majority Leader Charles E. Schumer (D-N.Y.) each offered their public, formal blessings for the nascent talks around a longer-term spending deal. Schumer added that the party’s negotiators are “on the same page,” though he and Pelosi noted they had not yet received an official counteroffer from their GOP counterparts.

The leaders of the House and Senate’s top panels overseeing appropriations then gathered on their own late Tuesday to try to put pen to paper. One of the participants in the bipartisan session, Sen. Richard C. Shelby (R-Ala.), later told reporters that lawmakers are still seeking an “agreement on our principles, then the [spending] top line will follow.”

Shelby acknowledged at the time that a slew of policy gaps still separate the parties, including the balance between “social spending versus national security.” But he joined his Democratic counterparts in maintaining that “we all want to try to get to yes,” adding: “We’re not there yet.”

Democrats seek significant boosts in federal domestic spending, now that the country for the first time in a decade is not bound to strict budget caps. Writing to her caucus last month, Pelosi endorsed the need for a “strong omnibus” that would “address critical priorities for our country, including for our national security and for communities at home.”

Yet some of the Democrats’ proposed spending increases and policy tweaks have troubled Shelby and his fellow Republicans. Beginning last year, they pointed to a series of “poison pills” — from Democratic plans to enhance the IRS to the party’s effort to loosen a long-standing ban on federal funding for abortion services — that could sink any talks on a deal. GOP lawmakers also have called for parity in defense and nondefense spending, a move that historically has troubled some Democrats, who have sought greater cuts to the Pentagon than even Biden has proposed.

“We’re looking for parity. We live in a troubled world and a lot of us think national security is important for this country,” Shelby, who leads the GOP on the Senate’s appropriations panel, stressed on Tuesday.

Democrats and Republicans otherwise appeared to downplay any potential disagreements following their flurry of meetings. Sen. Patrick J. Leahy (D-Vt.), the chairman of the chamber’s appropriations panel, described himself as “always optimistic.” Rep. Rosa L. DeLauro (D-Conn.), his counterpart in the House, declined to specify any timelines or expectations for the follow-up session set for Wednesday afternoon.

“The goal is to get an agreement,” DeLauro said.

But such a deal, known in congressional parlance as an omnibus, is likely to carry additional significance this year. The compromise could pave the way for billions of dollars to flow toward projects that would improve the nation’s roads, bridges, pipes, ports and Internet connections. Lawmakers approved the money as part of a bipartisan infrastructure law finalized in 2021, but the package requires them to complete the act of writing the check, so to speak, before the real work can begin.

The must-pass spending measure also could serve as a legislative vehicle for lawmakers to advance a slew of other critical priorities. That includes new disaster aid in response to recent hurricanes and the tornadoes in and around Kentucky last year, for example, along with billions of dollars to augment the country’s efforts to combat the coronavirus.

With cases still rampant from the omicron variant, Democrats in recent weeks have renewed their calls for more federal spending to boost testing, therapeutics and vaccine access, especially abroad. Others have sought to provide additional benefits to workers, including the revival of a program that offers limited, pandemic-related paid family and medical leave. And still other Democrats have joined with a small but growing crop of Republicans who hope to give the green light to new assistance targeting restaurants, gyms, stages and other small businesses.

Lawmakers begin talks on another round of coronavirus relief for businesses

Publicly, the White House has maintained in recent months that significant money remains as part of the roughly $1.9 trillion American Rescue Plan that Biden signed into law last spring. White House officials, meanwhile, have quietly started preparing a supplemental request focused on outstanding public health needs.

But the Biden administration by Tuesday afternoon had not transmitted any official request to the Capitol, Democratic leaders said. “We’re waiting for the administration to send us something. They haven’t sent us anything yet,” Schumer told reporters.

Some party aides acknowledged it had become a deliberate, delicate dance, reflecting an attempt to keep Congress focused on solidifying government funding levels without adding any other political complications.

#### 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.

#### Bipart’s key—otherwise, yearlong CR ruins defense industrial base and military modernization

Gould 1/22 [Joe Gould is senior Pentagon reporter for Defense News, “Defense industry frets as funding talks crawl”, 1/21/2022, https://www.defensenews.com/congress/budget/2022/01/21/defense-industry-frets-as-funding-talks-crawl/]

Despite repeated warnings from uniformed Pentagon leaders and lawmakers of both parties that a full-year continuing resolution will hurt national security, some defense industry advocates are still worried about an impasse.

On Thursday, both chambers of Congress left town on recess until the week of Jan. 31, after making scant progress on a deal for an omnibus federal spending package. Amid partisan divisions over funding levels and policy provisions, House Speaker Nancy Pelosi, D-N.Y., warned that a full-year CR would create a national security crisis ― in an effort to pressure Republicans.

“It is a national security issue of the highest priority, with the threats that exist out there. To go to a continuing resolution instead of a decision-making omnibus bill is to weaken our security and our stability,” Pelosi told reporters Thursday. “The Republicans should know that, so we hope we will be able to bring that legislation to the floor before [the current CR] expires.”

With fiscal 2022 spending bills four months overdue, lawmakers and the Pentagon have warned against a yearlong CR that would freeze defense spending at the level of 2021 appropriations. CRs continue funding at the previous year’s level, preventing the Pentagon from starting new acquisition programs and ramping up production quantities.

And without a 2022 spending deal to set a new baseline, the president’s budget submission is in limbo and expected to come months late, which is sowing uncertainty for the military and its vendors.

President Joe Biden signed a defense policy bill that boosts his $753 billion national defense budget request for FY22 to $778 billion, a 3% increase. But Republicans have said they want more for defense, less than the 16% increase proposed by Democrats and an agreement on some politically charged policy riders.

By the reckoning of National Defense Industrial Association Chairman Arnold Punaro, lawmakers could meet somewhere in the middle with 8% increases for both defense and nondefense, but that’s far from a certainty. Democrats have raised fears some Republicans see budget gridlock as an advantage heading into midterm elections and don’t want a deal at all.

“We’re still in budget chaos,” Punaro told Defense News this week. “China’s on the march, Russia’s on the move and North Korea’s on the advance, and yet Congress is sitting on their duff, not passing a spending bill. It’s disgraceful.”

The lack of a 2022 deal as a baseline for defense amid escalating inflation presents a huge challenge for Pentagon planners crafting the FY23 budget request, Punaro said. He worried the administration could make a flat budget request, potentially costing the Pentagon billions of dollars in buying power.

Meanwhile, a full-year CR would yield $11 billion of lost growth, while 7% inflation would mean another $50 billion in lost buying power, according to defense consultant Jim McAleese, the founder of McAleese & Associates.

Though the current CR runs out on Feb. 18., recent negotiations in Congress have sparked some optimism.

Lead appropriators in the Senate met Jan. 13 with Senate Majority Leader Chuck Schumer and Senate Minority Leader Mitch McConnell to set the guidelines for negotiations. From there, lead House and Senate appropriators met to kick off talks, and Pelosi has said she’s been in discussions with House Appropriations Committee Chairwoman Rosa DeLauro, D-Conn.

Asked Thursday whether it’s realistic to get an agreement by Feb. 18, as Congress was about to leave town Senate Appropriations Committee Vice Chairman Richard Shelby, R-Ala., said: “That’s a good question. It’d be hard to get it by the 18th, but if we can make huge progress, we can probably get done soon.”

It’s unclear whether looming international crises with Russia and Ukraine, China and Taiwan, and North Korean missile tests would add pressure to pass defense spending. When asked about Pelosi’s comments, Shelby seemed to dig in.

“She’s right on that, but to underfund defense as some people would like to do, that would be a bigger challenge,” he said.

At a House Appropriations Committee hearing Jan. 12 about the effects of a potential full-year CR, the top officers of the Army, Navy, Air Force, Marine Corps and Space Force warned such a move would sabotage the military’s efforts to compete with China by stalling new weapons like hypersonic missiles.

“CRs effectively prevent modernization at speed,” said Marine Corps Commandant Gen. David Berger. “We actually stand to be outpaced by China — not because of their speed but because of our failure to comply with our own budgetary processes.”

The president and CEO of the Aerospace Industries Association, Eric Fanning, has warned that budget unpredictability is inefficient for the defense industry, which has to idle while the Pentagon waits for its projects to be funded. Amid the Capitol Hill activity, Fanning said he is “hopeful that the momentum continues.”

“The hearing painted a concerning picture of additional and unnecessary costs, as well risks to capabilities and to the industrial base in the short and long-terms. There was bipartisan agreement on how devastating a year-long CR could be,” Fanning said in a statement Thursday. “Over the last few days, there are positive signs that the message is getting through and the top appropriators from both parties are coming to the table.”

Lead Pentagon officials have talked for years about the need to harness the innovation of small tech firms. But CRs stifle those efforts, an executive at one of those firms, Anduril Industries, wrote in an essay this week.

#### Impact’s cyber and deterrence crash

Manchester ’19, [Josh, Founder of Champion Hill and General Partner at Foundation Capital, Venture-backed Startups Will Build the Defense Technology the Free World Needs Right Now, https://medium.com/@joshmanchester/venture-backed-startups-will-build-the-defense-technology-the-free-world-needs-right-now-d2cefa2b2196]

With U.S. defense spending exceeding $700 billion per year, how could the United States be on the brink of a national security emergency? Simply put, America’s national security competitors are outflanking an Industrial-Age U.S. military machine that, like a lumbering dinosaur, is not adapting fast enough to its changing environment. The Pentagon desperately needs rapid innovation. Yet the current defense industry structure is not compatible with U.S. venture capital and high-growth technology industries for several reasons: · The U.S. military’s industrial base is centered on a few huge oligopoly suppliers known within the Beltway as “the Primes” — Lockheed Martin, Boeing, Raytheon, General Dynamics, and Northrop Grumman. These companies, ancient by tech startup standards, have optimized themselves to sustain a 20th century Industrial Age World War II-style force structure which supports the political decision-makers across the country who appropriate the funding that industrial base receives. The Primes are great at building very large platforms that cost billions of dollars and take 15–30 years to field. The Primes are also historically heavy on hardware talent and much lighter on software talent. · The Primes receive the vast majority of defense spending. Defense budgets have historically not unlocked for startups. While a defense private equity industry exists to aggregate small companies and flip them downstream to the Primes, venture capital investors, who have a much higher return threshold, know that it’s hard to have venture outcomes (in other words, to make money) when a company can’t win large market share or survive as a stand-alone business. · Venture-backed tech industries have matured as an asset class in peacetime and most mainstream U.S. venture firms in existence today do not have institutional cultures or histories that include defense innovation, apart from cybersecurity. · Major tech companies, like the FAANGs (Facebook, Apple, Amazon, Netflix, Google and Microsoft too), are generally unwilling to work on defense related projects, and sometimes must deal with employee protests when they do. · Many observers perceive this as an indicator that software engineers generally don’t want to work on defense-related innovation. · Finally, in a bizarre set of twists, some of the organizations that comprise the Limited Partners of venture capital firms (the blue chip endowments and foundations of the U.S. Eastern establishment, often founded on the fortunes of great American industrialists from decades ago, along with public pension funds throughout the country) are [sometimes accidentally funding Chinese defense technology](https://www.buzzfeednews.com/article/ryanmac/us-money-funding-facial-recognition-sensetime-megvii) while often restricting their U.S. venture managers from making defense investments. Foundations and endowments in particular often have negotiated Limited Partnership Agreements with the venture firms they finance precluding them from investing in anything that could have military usage. The irony is that these same tax-exempt pools of capital are frequently investors in Chinese venture funds which provide software to make smarter and more deadly Chinese weapons and to the advanced surveillance systems that have turned China’s Xinjiang province into a virtual Uighur prison camp and a human rights disaster. No single individual or entity has caused this state of events to transpire; it is simply the accumulation of various cultural aspects of the capital formation process of the venture industry and its portfolio companies. Fortunately, we believe that almost all these characteristics will rapidly change over the next few years. But first let’s discuss some additional background. Venture capital has come of age in a time of unprecedented peace The U.S. venture capital industry is about 100 years old. Bessemer Ventures was formed in 1911 and originally had just the family fortune of Henry Phipps Jr., a co-founder of Carnegie Steel, as its sole limited partner. Despite these deep roots, the U.S. venture industry has only institutionalized as an asset class since the mid-1990s. Until then it was extremely clubby and very small. Sequoia Capital, KPCB, Charles River Ventures, and NEA were all founded in the 1970s and Accel Partners in the 1980s. But it has really only been since the mid-1990s (Benchmark Capital was founded in 1995, as was my own former firm, Foundation Capital) that the industry has institutionalized and grown substantially, first in the desktop computing and internet boom, and second during the combination of platform shifts over the last ten years that have given us mobile computing, social media, e-commerce, cloud computing, software-as-a-service and all of their associated new business models. For a quarter of a century, the institutional, mainstream venture investing ecosystem, at the startup, venture firm and limited partner levels, developed business processes, mental models, networks, and expertise in certain technical areas and heuristics — in aggregate, an industry culture — that have created one of the most dynamic parts of the U.S. economy. The U.S. tech industry is also one of the most unique aspects of American life — and a powerful, difficult-to-replicate form of “soft power,” featuring an inclusivity for aspirational immigrant founders — a feature perhaps unequalled in human history. From a long-term U.S. historical viewpoint, it is striking that the venture industry’s maturation has occurred during a unique period in American history when the United States had no major great power competitor, either ideologically or technologically. The Cold War ended in 1991, the Soviet Union dissolved, and Russia was in disarray for the next 15 years. This period of peace was not without its own unique trials, but the security challenges associated with terrorism, counterinsurgency, and lower-intensity military activity have not required the sort of Herculean societal and political efforts that were drawn upon during the Cold War or World War II. We should all be grateful every day that this has been the reality of the last 25 years. A useful analogy might be made with gold. In 1933, President Roosevelt made it illegal for U.S. citizens to own gold. In 1934, Benjamin Graham published the first edition of Security Analysis. In January 1975 it became legal to own gold again. Graham died in 1976. It was therefore illegal to own gold during key years of the development of modern security analysis. From this gap came gold bugs — the weirdos who seemed to always talk about nothing else, and didn’t get invited to key social events. No analogies are perfect but this captures some of the similarities between venture and defense today. Cybersecurity investors understand the cybersecurity parts of U.S. defense. But most mainstream Silicon Valley venture firms do not spend time on other parts of defense due to the industry’s institutionalization during this recent period of relative peace and American dominance — which has also been a time when the lion’s share of defense spending has gone to the Primes, as discussed. Sadly, peace is ahistorical. Great power competitions are a feature of humanity, not a bug. Periods of time when a major power, or superpower, are not challenged in some profound fashion by one or more other powers, regardless of whether they are driven by fear, prestige, economic interest, or ideology — are, in short, rare when looking back on the sojourn of homo sapiens on planet earth. The period when the free world had a monopoly on power has now ended. The tech-defense status quo is inverting The only previously delineated area where we don’t expect much change is from the FAANGs. These massive companies are best viewed as small nation-states themselves with global stakeholders. For example, many of their employees are not U.S. citizens and may not want their employers engaged in U.S. defense work. We think everything else will invert. · We believe defense budgets will begin unlocking for young startups. Many key national security decision-makers in Washington are now seeking better, faster alternatives to the byzantine Pentagon acquisitions process. Thought leaders like Will Roper, in charge of the U.S. Air Force’s $40 billion annual research and acquisition budget, are [eagerly welcoming the contributions that smaller, nimble venture-capital funded entrepreneurs can make](https://federalnewsnetwork.com/dod-reporters-notebook-jared-serbu/2019/03/air-force-looks-to-build-big-idea-pipeline-to-expand-its-industrial-base/). Roper, and others in the Pentagon, are reforming their practices to make it easier for genuine innovators to compete against the legacy defense oligopoly. When recently asked at a conference what problem keeps him up at night, Roper replied, “The industrial base.” · Given the hardware roots of the Primes, they are ill-suited to provide solutions to many of the most pressing problems today. The Defense Department will increasingly allocate resources to startups solving software problems for which the Primes have no existing stock of machine learning engineers. · As this happens some venture firms will experience cultural shifts toward more defense investing. As venture capitalists see that startups are receiving large purchase orders from various Defense Department units, they will develop strategies to deploy capital toward defense innovation. A good example is [last week’s award by the Air Force of $121 million to Pivotal Software in San Francisco](https://dod.defense.gov/News/Contracts/Contract-View/Article/1861753/source/GovDelivery/). · Institutional limited partners as a group will likely slowly allocate away from any China-based manager who could be investing in Chinese military technologies. Some LPs with the freedom to do so may remove restrictions on defense investing from limited partnership agreements. · We believe it is a myth that software engineers do not want to work on defense. This is a classic case of preference falsification, the social phenomenon in which people do not speak their true minds about a given topic, though their actions often indicate otherwise. We believe that talented engineers are often very attracted to defense-related work because it often offers the hardest problems to solve. An enormous opportunity therefore exists for startups: to hire the engineers who don’t want to work for ancient and outdated Primes, and who aren’t very welcome at the FAANGS, but who wish to create the technologies that an increasingly eager democratic government needs to defend itself and its allies. Companies in our own portfolio, like [SpaceX](https://www.spacex.com/), [Rigetti Computing](https://www.rigetti.com/), [Anduril Industries](https://www.anduril.com/), and [Umbra Lab](https://umbralab.com/) are executing this strategy. The hardest technical problems today are defense-related How can data from satellites, drones, land-based radar, ships, and other sources be stitched together, in real time, to find long-range missiles on mobile transporters, hiding among the background in cities, forests, and mountains? How can friendly troops, who have separated into very small units in order to hide and survive, be connected to each other electronically, and be resupplied from historically long ranges? How and to what degree and in what conditions should an adversary’s sensor networks be spoofed? What type of false electronic picture can be painted? The aggregation of targeting data for an air wing takes 72 hours today and has a heavy human component. Can this complex optimization problem be solved autonomously, such that the targeting list for pilots is developed in 15 minutes? How does a deployed force of perhaps 50,000 personnel, with planes, ships, and land forces, continue to fight when satellite links have been knocked out, and “reachback” to the U.S., for data processing, is no longer possible? Can deep learning be used for crisis diplomacy? Put another way, since DeepMind’s AlphaZero can teach itself to move pieces forward on a board to win a game, can it learn to move them backwards, to de-escalate a crisis? These problems, and many others, are asking to be solved by entrepreneurs. Phase change There is a looming breakdown in deterrence. If the U.S. defense establishment is unable to adapt to the new great power competitive environment, then adversaries will be tempted to grab for a fait accompli, with war the result. This has been the pattern since Homer wrote The Iliad; there is no evidence to conclude human behavior is different in the 21st Century. We believe the prevention of this scenario involves rapid technical innovation. The defense environment is more favorable now for upstart firms than anytime in the past several decades. If you are a founder building technology to ensure the survival of government by consent, our firm would like to talk to you.

## 3

#### Commercial asteroid mining is coming now – lower costs and improving tech make it economically viable – and the legal basis is already in place in multiple countries– that helps acquire water for rocket fuel and rare earth metals

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Space exploration is back. after decades of disappointment, a combination of better technology, falling costs and a rush of competitive energy from the private sector has put space travel front and center. indeed, many analysts (even some with their feet on the ground) believe that commercial developments in the space industry may be on the cusp of starting the largest resource rush in history: mining on the Moon, Mars and asteroids.

While this may sound fantastical, some baby steps toward the goal have already been taken. Last year, NASA awarded contracts to four companies to extract small amounts of lunar regolith by 2024, effectively beginning the era of commercial space mining. Whether this proves to be the dawn of a gigantic adjunct to mining on earth — and more immediately, a key to unlocking cost-effective space travel — will turn on the answers to a host of questions ranging from what resources can be efficiently.

As every fan of science fiction knows, the resources of the solar system appear virtually unlimited compared to those on Earth. There are whole other planets, dozens of moons, thousands of massive asteroids and millions of small ones that doubtless contain humungous quantities of materials that are scarce and very valuable (back on Earth). Visionaries including Jeff Bezos imagine heavy industry moving to space and Earth becoming a residential area. However, as entrepreneurs look to harness the riches beyond the atmosphere, access to space resources remains tangled in the realities of economics and governance.

Start with the fact that space belongs to no country, complicating traditional methods of resource allocation, property rights and trade. With limited demand for materials in space itself and the need for huge amounts of energy to return materials to Earth, creating a viable industry will turn on major advances in technology, finance and business models.

That said, there’s no grass growing under potential pioneers’ feet. Potential economic, scientific and even security benefits underlie an emerging geopolitical competition to pursue space mining. The United States is rapidly emerging as a front-runner, in part due to its ambitious Artemis Program to lead a multinational consortium back to the Moon. But it is also a leader in creating a legal infrastructure for mineral exploitation. The United States has adopted the world’s first spaceresources law, recognizing the property rights of private companies and individuals to materials gathered in space.

However, the United States is hardly alone. Luxembourg and the United Arab Emirates (you read those right) are racing to codify space-resources laws of their own, hoping to attract investment to their entrepot nations with business-friendly legal frameworks. China reportedly views space-resource development as a national priority, part of a strategy to challenge U.S. economic and security primacy in space. Meanwhile, Russia, Japan, India and the European Space Agency all harbor space-mining ambitions of their own. Governing these emerging interests is an outdated treaty framework from the Cold War. Sooner rather than later, we’ll need new agreements to facilitate private investment and ensure international cooperation.

What’s Out There

Back up for a moment. For the record, space is already being heavily exploited, because space resources include non-material assets such as orbital locations and abundant sunlight that enable satellites to provide services to Earth. Indeed, satellite-based telecommunications and global positioning systems have become indispensable infrastructure underpinning the modern economy. Mining space for materials, of course, is another matter.

In the past several decades, planetary science has confirmed what has long been suspected: celestial bodies are potential sources for dozens of natural materials that, in the right time and place, are incredibly valuable. Of these, water may be the most attractive in the near-term, because — with assistance from solar energy or nuclear fission — H2O can be split into hydrogen and oxygen to make rocket propellant, facilitating in-space refueling. So-called “rare earth” metals are also potential targets of asteroid miners intending to service Earth markets. Consisting of 17 elements, including lanthanum, neodymium, and yttrium, these critical materials (most of which are today mined in China at great environmental cost) are required for electronics. And they loom as bottlenecks in making the transition from fossil fuels to renewables backed up by battery storage.

#### However, the legal framework that strikes the best balance of providing economic incentives for mining while preventing unbeneficial land claims requires a doctrine of appropriation – the plan prevents that

Meyers 15 Meyers, Ross. J.D. candidate at the University of Oregon Law School. "The doctrine of appropriation and asteroid mining: incentivizing the private exploration and development of outer space." Or. Rev. Int'l L. 17 (2015): 183. Italics in original. [Quality Control]

The doctrine of appropriation is a reasonable rule for adjudicating asteroid claims, and it could easily be modified to apply to asteroid mining. In the context of water rights, the doctrine of appropriation requires that the claimant be a landowner in order to claim the right to use a water source. It does not make sense, however, for the international community to grant complete ownership over asteroids toa single entity, so the landowner requirement of the rule should be removed. A similar modification would need to be made to the "beneficial use" language of the doctrine.

In the context of water rights, an appropriator obtains rights only to water that he or she can reasonably put to beneficial use. The metals contained in asteroids have a high level of marketability. For that reason, a mining entity could potentially put any amount of obtained metal to beneficial use, in the sense that the resources can be sold. This, however, would defeat the purpose of the rule, which is to limit such unreasonable claims. To ameliorate this problem, the doctrine of appropriation could be modified to define "beneficial use "constructively by providing that beneficial use is assumed for any resources that have been removed from the asteroid that the mining entity can reasonably hope to transport to market in a return journey. With the astronomical cost of undertaking a trip to such an asteroid, this modification would limit mining entities to only what they can carry back, thereby leaving the untapped resources available to other entities capable of making the same trip. Considering the size and profitability of metal deposits on asteroids, this modification to the doctrine of appropriation would not be overly burdensome to corporate interests. At the same time, it would satisfy the economic imperative of promoting the rapid development of asteroid resources.

By changing the landowner requirement, and qualifying the “beneficial use" language, the doctrine of appropriation would be essentially ready for application to asteroid mining claims. The only other changes necessary would be some additional requirements that are common to other space related provisions, like those found in the Outer Space Treaty of 1968. For example, a reporting requirement or clause guaranteeing asylum for other astronauts. A functional rule might read something like this:

*State parties or private entities may, upon actual possession, lay claim to natural resources found on or below the surface of asteroids. Rights to appropriate are given in order of seniority, starting with the first party to land on the surface of the asteroid and establish control over the resources, be it water, methane, metal, or any other beneficial substances. A party will be said to have established control over a resource once he has mined the substance and removed it from the asteroid. A senior appropriator may use as much of the asteroid's resources as he can take from the asteroid and put to beneficial use, and may continue to enlarge his share until another junior appropriator begins to appropriate resources from source for beneficial use. For the purposes of this Agreement, "beneficial use “refers to the amount of resources that an appropriator has removed from the asteroid that the actor may reasonably hope to bring home in a return voyage. Resources in excess of what an appropriator can reasonably hope to transport to market in a single voyage do not qualify as having a beneficial use, and are therefore not yet claimed. This means that the extraction of metal from an asteroid does not serve to provide ownership if the appropriator plans on letting the resources languish until another voyage is undertaken to secure the resources and bring them back to Earth. Junior appropriators receive rights in the source of resources (the asteroid) as they find it, and may prevent the senior appropriator from enlarging his share to the junior appropriator’s detriment under a no-injury rule. No state party will attempt to hinder other parties from landing on or using the asteroid, and parties will assist other entities on an asteroid, should they need emergency assistance. Mining claims on asteroids will be reported to the Secretary-General of the United Nations, and state parties agree to release the location of the asteroid, and any scientific findings to the United Nations, the general public, and the scientific community. In the event that the asteroid is on a collision course with any other celestial body, all state parties agree to follow the course of action suggested by the United Nations. Should the United Nations decide the asteroid must be destroyed, no state party may claim liability for resources contained within the asteroid, but not yet captured. This provision applies only to asteroids as classified by the scientific community, and does not apply to planets, comets, meteorites, or any other celestial body not mentioned.*

There is no doubt that asteroids may be extremely beneficial to mankind, both as a source of resources and as a jumping-off point to far off locations in space. The human-race has progressed scientifically and technologically to the point that space travel is within commercial reach, and the need for new international laws governing the ownership of space has never been more apparent. The Outer Space Treaty of 1968made great strides in developing rational rules for space and many of its provisions should be maintained in their original form. However, by allowing ownership of asteroids under the doctrine of appropriation, the international community can incentivize the exploration and development of space in a way that reflects the needs of society in general, without vesting an absolute monopoly in a single entity. The doctrine of appropriation helped drive American westward expansion, and its application to space mining would help drive the human race in its expansion into the space, the final frontier.

#### Asteroid mining offsets terrestrial growth that ruins the environment and enables solar power satellites – both solve climate change

Taylor 19 Chris Taylor is a veteran journalist. Previously senior news writer for Time.com a year later. In 2000, he was named San Francisco bureau chief for Time magazine. He has served as senior editor for Business 2.0, West Coast editor for Fortune Small Business and West Coast web editor for Fast Company. Chris is a graduate of Merton College, Oxford and the Columbia University Graduate School of Journalism. "How asteroid mining will save the Earth — and mint trillionaires." Mashable, 2019, mashable.com/feature/asteroid-mining-space-economy. [Quality Control]

The mission is essential, Joyce declares, to save Earth from its major problems. First of all, the fictional billionaire wheels in a fictional Nobel economist to demonstrate the actual truth that the entire global economy is sitting on a mountain of debt. It has to keep growing or it will implode, so we might as well take the majority of the industrial growth off-world where it can’t do any more harm to the biosphere.

Secondly, there’s the climate change fix. Suarez sees asteroid mining as the only way we’re going to build solar power satellites. Which, as you probably know, is a form of uninterrupted solar power collection that is theoretically more effective, inch for inch, than any solar panels on Earth at high noon, but operating 24/7. (In space, basically, it’s always double high noon).

The power collected is beamed back to large receptors on Earth with large, low-power microwaves, which researchers think will be harmless enough to let humans and animals pass through the beam. A space solar power array like the one China is said to be working on could reliably supply 2,000 gigawatts — or over 1,000 times more power than the largest solar farm currently in existence.

“We're looking at a 20-year window to completely replace human civilization's power infrastructure,” Suarez told me, citing the report of the Intergovernmental Panel on Climate Change on the coming catastrophe. Solar satellite technology “has existed since the 1970s. What we were missing is millions of tons of construction materials in orbit. Asteroid mining can place it there.”

The Earth-centric early 21st century can’t really wrap its brain around this, but the idea is not to bring all that building material and precious metals down into our gravity well. Far better to create a whole new commodities exchange in space. You mine the useful stuff of asteroids both near to Earth and far, thousands of them taking less energy to reach than the moon. That’s something else we’re still grasping, how relatively easy it is to ship stuff in zero-G environments.

#### Environmental destruction is profoundly unjust – prioritize environmental justice over primarily human concerns

Cafaro 14 Dr. Philip Cafaro (philip.cafaro@colostate.edu) is Professor of Philosophy at Colorado State University, an affiliated faculty member with CSU's School of Global Environmental Sustainability and Book Review Editor of Elsevier's Biological Conservation journal. His main research interests are in environmental ethics, consumption and population issues, and wild lands preservation. He is the author of Thoreau's Living Ethics and Life on the Brink: Environmentalists Confront Overpopulation, among other books. Dr. Richard B. Primack (primack@bu.edu) is Professor of Biology at Boston University [go terriers!] and Editor-in-Chief of Biological Conservation, an Elsevier journal focusing on the protection of biodiversity. His research concerning the effects of climate change on the plants and animals of Massachusetts is the focus of a new book coming out in March titled Walden Warming: Climate Change Comes to Thoreau's Woods. "Species extinction is a great moral wrong." Elsevier Connect, 12 Feb. 2014, [www.elsevier.com/connect/species-extinction-is-a-great-moral-wrong](http://www.elsevier.com/connect/species-extinction-is-a-great-moral-wrong). [Quality Control]

Extinguishing species through the continued expansion of human economic activities appears to be morally acceptable to Kareiva, Marvier and some other Anthropocene proponents, as long as this destruction does not harm people themselves. But this view is selfish and unjust. Human beings already control more than our fair share of Earth's resources. If increased human population and economic demands threaten to extinguish the polar bear and many other species, then we need to limit our population and economic demands, not make excuses that will just lead to greater ecological damage.

Conservation biologists, with our knowledge and appreciation of other species, are the last people who should be making excuses for their displacement or making light of their extinction. It is particularly inappropriate for Peter Kareiva to do so, given his position as chief scientist at the Nature Conservancy, an organization dedicated to preserving biodiversity. TNC's fundraising rests in part on appeals to a strong and widely shared moral view that other species have a right to continued existence. Much of the conservation value of TNC's easements and land purchases depends on society-wide moral and legal commitments to preserve threatened and endangered species and their habitats. Kareiva and Marvier state that they "do not wish to undermine the ethical motivations for conservation action," or presumably, conservation law. Yet their articles do precisely that, with potentially disastrous implications for practical conservation efforts, particularly in the long term.

To be clear: We do not think there is anything wrong with people looking after our own legitimate needs. This is an important aspect of conservation. Kareiva and Marvier are right to remind us that protecting ecosystem services for human beings is important. They are right that concern for our own wellbeing can sometimes motivate significant biodiversity preservation. We believe that people should preserve other species both for their sakes and for ours.

But it is a mistake to reduce conservation solely to concern for our own well-being, or to assume that it is acceptable to extinguish species that do not benefit humans. Such an overly economistic approach to conservation leads us astray morally. It makes us selfish, which is the last thing we want when the very existence of so many other life forms is at stake. Fairly sharing the lands and waters of Earth with other species is primarily a matter of justice, not economic convenience.

## Case

### Space Debris

#### Satellite loss shuts down global fracking

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Energy, environment, farming, mining, land use. All of these areas and more are now inextricably linked to satellite data and would be devastated should that flow of data stop.

Environmental Monitoring

Oh how complacent we've become. We take for granted that we will have instant images from space showing a volcanic eruption somewhere in the South Pacific within hours of learning that it happened. When the BP oll spill happened in the Gulf of Mexico in 2010, satellite images were used in conjunction with aircraft and ships to monitor the extent and evolving nature of the spill (Figures 10.1 and 10.2).

The data were also used to direct the ships that were attempting to clean up the spill, to warn fishermen of areas in which it would be dangerous to fish, and to generally monitor the extent of the disaster. This is the type of data we get from space in a field known as remote sensing.

Remote sensing is, well, exactly what its name implies. With it, you gather data, or sense, usually in the form of electromagnetic radiation (light), remotely - that is, you are not physically touching what you are looking at. Satellite remote sensing began shortly after we began launching satellites and many industries are now totally dependent upon having the capability.

We use satellites, like the venerable Landsat series, to study the Earth m unprecedented detail. Since 1972, Landsat satellites have taken millions of high resolution images of the Earth's surface, allowing comprehensive studies of how the land has changed due to human intervention (deforestation, agriculture, settlement, etc.) and natural processes (desertification, floods, etc.).

The best way to understand how useful Landsat and similar data can be to governments at all levels is best illustrated by looking at 14then and now" photographs. For example, Africa's Lake Chad has been shrinking for 40 years, as the desert has encroached on this once plentiful inland freshwater lake. Forty years ago, there were about 15,000 square miles of water within the lake. Now, it is less than 500 square miles (Figure 10.3) [1].

And what is the practical side of this particular bit of information?

Governments use this type of satellite imagery to avoid human tragedy. Hundreds of thousands of people, if not millions, depend upon the waters of Lake Chad for agriculture, industry, and personal hygiene. With the lake going dry, how has this impacted on their livelihoods, their families, and their very lives?

The European Space Agency (ESA) is freely providing satellite data to developing countries as they search for new sources of drinking water. For example, ESA assessed data obtained from space over Nigeria to find over 90 new freshwater sources within that country. After ground teams visited the new sites, all were confirmed to contain fresh water. This was no accident. These were satellites with sensors developed for just such purposes in mind [2].

Desertification is but one example of changing climates affecting people's everyday lives. What about more direct observations of our impact on the planet? Figures 10.4 and 10.5 show the scarring of the Earth's surface as a result of surface mining in West Virginia. This is not a polemic against mining; rather, it is an observation that we can use satellite imagery to monitor such mining and be mindful of its impact on the environment.

Other than taking pictures of surface features, like lakes and open pit mines, how are satellites monitoring the Earth's changing climate? In just about every way, by: monitoring global land, sea, and atmospheric temperatures; measuring yearly average rainfall amounts just about everywhere on the globe; measuring glaciation rates; measuring sea surface heights; and more. Remote sensing is more than taking pictures of the Earth in the visible part of the spectrum. We can learn a great deal from looking at part of the spectrum that our eyes cannot see - but our instruments can.

Shown in Figure 10.6 is a composite image of the Earth's surface showing the average land-surface temperature at night. The data came from two NASA satellites, Terra and Aqua, as they orbit the Earth in a polar orbit. (This means that they circle the Earth from top to bottom, passing over both the North and South Poles with each complete orbit.) Terra's orbit is such that it passes from the north to the south across the equator in the morning; Aqua passes south to north over the equator in the afternoon. Taken together, they observe the Earth's surface in its entirety every two days. Data sets such as this exist for just about any day of the year and can show either night-time lows or daytime highs.

By looking in different parts of the spectrum, like the infrared light discussed above, we can make observations as described in Table 10.1.

Pollution Monitoring

As emerging countries industrialize, they also become polluters. Many of these countries are not exactly forthright about releasing air-pollution details to the media, so much of our awareness of the rising pollution there is anecdotal - typically m the form of stories told by people who have visited these countries and seen the extreme pollution at first hand. This, by the way, is not exactly scientific.

Using satellites, and not relying on either the governments in question or second-hand stories, we can accurately assess the pollution levels there and elsewhere. Using satellite images to measure the amount of light absorbed or blocked by fine particulates in the atmosphere, otherwise known as air pollution, you can determine not only what the airborne pollutant might be, but also its size. And, by looking at the overall light blockage, an accurate estimate of the amount of pollution in the air can also be made. Recent studies show that many of these countries are covered in a pollution cloud that countries in the developed world would deem extremely harmful. And how do we know this with scientific certainty? From satellite measurements.

Energy Production

The recent boom in the production of shale oil in the United States and elsewhere is due in large part to the identification and geolocation of promising geologic formations for test drilling and fracking. "Fracking" is a somewhat new term that comes from the phrase "hydraulic fracturing". In fracking, massive amounts of previously unusable reservoirs of oil and natural gas are released for capture, sale, and transport from deposits deep within the Earth - many located at least a mile below the surface. In the United States alone, there may be as much as 750 trillion cubic feet of natural gas within shale deposits releasable by fracking [3]. How do energy companies know where to look for these deposits? In large part, by analyzing satellite imagery.

According to Science Daily (26 February 2009), a new map of the Earth's gravitational field based on satellite measurements makes it much less resource intensive to find new oil deposits. The map will be particularly useful as the ice melts in the oil-rich Arctic regions. The easy-to-find oilfields have already been found. To fuel the growing world economy, those harder-to-find deposits must be located and tapped - which is why satellite imagery is so important. Take away this and other satellite-dependent techniques of oil and gas exploration and the world economy will feel the impact through higher oil and natural gas prices.

#### Fracking makes extinction inevitable---try-or die to shut it off

Rev. Mac Legerton 18, Co-Founder and Executive Director of the Center for Community Action, Member of the Board of Directors of the NC Climate Solutions Coalition, Member of the Board of Directors of the Windcall Institute, “Will The U.S. Blaze A Trail To Mass Extinction?”, APPPL News, 1/15/2018, https://www.apppl.org/news/will-the-u-s-blaze-a-trail-to-mass-extinction/

As an elder, I now realize that there is even a greater threat to humanity and life on Earth than nuclear war—though, unlike a nuclear exchange, this threat is a slow-motion catastrophe. Can you guess what it is? Here’s a clue: it is something with which most people don’t have a personal relationship. Tragically, some persons remain in total denial of its validity, much less its present danger. And that’s the problem – that’s why this threat needs to be more seriously addressed on the local, state, national, and international level.

What is it? It’s the slow-motion but rapidly growing catastrophe of climate change. There’s now good news amidst this seemingly overwhelming challenge. But the answer may surprise you. Today we know what is the #1 preventable cause of climate change. It’s not coal, it’s not nuclear, and it’s not oil and gasoline. It’s actually the use of the very fuel that is touted as being cleaner, greener, and cheaper than all the rest. This fuel is called “Natural Gas”.

Let’s start with its name – “Natural Gas”. What is “natural gas”? There’s actually nothing “natural” about it when it is forcibly extracted from the ground through hydraulic fracturing, commonly known as “fracking”. When something is forcibly ruptured from deep within the earth with the use of toxic chemicals, the last name you would use for it is “natural”.

Fracking disrupts the geologic fault lines causing earthquakes, uses millions of gallons of fresh water that becomes permanently poisoned by unknown, cancer-producing chemicals added to it, creates air pollution during the drilling process, increases the risk of injury and explosions, raises major health risks to both people and place in close proximity to it, and changes the nature of both neighborhoods and landscapes. Fracking also leaves a massive carbon footprint of drilling wells as deep as 8,000 feet and then drilling horizontally over 10,000 feet; On top of all this, it leaks major amounts of gas into the environment.

So, what is this gas? It is 90-95% methane gas which is a hydrocarbon compound made up of one carbon atom and four hydrogen atoms (CH4). It releases carbon into the atmosphere and produces carbon dioxide (C02) just like coal does when it is burned. Methane is not its trace element–it is its undisputed compound of this fossil fuel product. If a compound is 90-95% of a product, it makes sense to call it by that name. Doesn’t it? Well, actually not if you want people to believe and think that it is something that it is not. It is un-natural methane gas produced under massive and highly toxic pressure and hazardous conditions.

Now that we know what this gas is, what does it do to the atmosphere and climate that is so dangerous? This hydrocarbon has properties that block the radiation of heat from Earth’s surface 100 times more effectively than CO2 (released from burning coal) during its first 10 years of release and 86 times more effectively in its first 20 years. Because of the climate emergency underway, the first 10 or 20 years matter most.

When utility companies and the larger fossil fuel companies state that they are committed to lowering carbon emissions, this just isn’t true. They are radically escalating the most dangerous and worst of all fossil fuels in relation to its impact on the climate. Now the industry wants to expand production of methane gas all over the world by calling it “the most environmentally friendly fossil fuel”and a “bridge fuel” that we can safely use until we transition to 100% renewable energy sources.

Why would a major business industry want to call its product by another name? Perhaps for the same reason that the tobacco industry did not like the term “coffin nails” or “cancer sticks” for cigarettes. Honestly, there’s a striking similarity between what are called cigarettes and natural gas. When both were produced and named, their harm was not fully known. Once the industries promoting them learned of their significant harm, they did everything they could to hide this knowledge from the public. They even hired scientists to deny their dangers. The tobacco industry was eventually sued, the truth was acknowledged, and billions of dollars were paid out in the tobacco settlement.

This same scenario that occurred with the tobacco industry needs to occur with methane gas and the fossil fuel industry. The major difference in these two scenarios is that that this fossil fuel product doesn’t just threaten the lives of individuals who voluntarily breathe it in – it threatens the lives of not only every human being, but also all life on the planet. The outcome of this scenario needs to be a moratorium and eventual end to all use of methane gas as an energy source. For the sake of all of us, our communities, and world, the sooner the better. This abomination is different. There is no time to waste.

#### Loss of satellites will shut down terrestrial mining

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Resource Location

Looking for rare minerals to be mined for our many gadgets, household appliances, and industrial machines? Soil type is often a strong indicator of whether or not underground deposits of metals and minerals are located. By using satellite data to identify promising surface structural features and different soil types, mining companies can better identify promising mining locations, wasting less time and effort in finding the best places to obtain much-needed industrial resources. Without satellite images, the finding and assessment of promising new mines would grind to a halt as the industries retooled back into the days of much slower and labor-intensive field surveys (but without GPS!).

#### Amazon mining will cause extinction

Charito Ushiñahua 11, Anthropologist Working for the Preservation of Indigenous Amazonian Cultures, “Yanomami Indians: The Fierce People?”, http://www.amazon-indians.org/yanomami.html

A mineralogical survey of the northern Amazon by the Brazilian government in 1975 revealed the presence of gold ore in the Roraima region of Brazil. By the early 1980's, miners in search of gold began invading the Yanomami territory in Brazil and by 1987 it had become a full-fledged gold rush. Over 30,000 prospectors entered Yanomami lands and established over a hundred clandestine mining operations. The resulting massacres and diseases brought by these invaders is estimated to have caused the death of over 2,000 Yanomami. One of the problems with gold mining is the environmental destruction it causes. In order to separate gold from rocks and soil, mercury is used. Mercury in the rivers and streams bio-accumulates and permeates the entire ecosystem. The mercury accumulates in predators and hunters (such as the Yanomami) higher up the food chain and creates a neurotoxin that causes birth defects and abnormal child development. The Yanomami have had increased child mortality rates while their birth rates have declined putting their very existence into risk. Moreover, malaria increased in the area due to the stagnant pools left by the miners that increase the mosquito populations that are vectors of the disease. Some have estimated that malaria is responsible for the deaths of about 13% of the Yanomami population every year. However, the negative influence of the miners extends beyond physical health. Their introduction of alcohol and other western goods has had an immense negative effect on Yanomami society itself.

In response to the crisis created by the gold miners, in 1992 the Yanomami territory was protected by the Brazilian government by creating a federal indigenous reserve. However, the gold miners were not happy about the creation of the reserve and in July, 1993, a group of miners tried to exterminate an entire village in what has become to be known as the "Haximu Massacre." At lease 16 Yanomami were killed in what many have called genocide. Some of the miners were tried and convicted and after numerous appeals on the 7th of August, 2006 the Brazilian Supreme Federal Court reaffirmed that the crime known as the Haximu Massacre and upheld the ruling sentencing the miners to 19 years in prison for genocide. However, to this day there is political pressure by the mining industry to reduce the Yanomami territory and allow commercial mining operations on their lands.

In the year 2000, a journalist named Patrick Tierney published a book called, "Darkness in El Dorado," and accused anthropologist Napoleon Chagnon and his colleague geneticist James Neel of numerous misdeeds, among them intentionally creating an epidemic of measles among the Yanomami people in order to study the effects of natural selection on primitive societies. Tierney states that the resulting epidemic caused the death of hundreds of Yanomami. Incredibly, Tierney charged that the experiments were funded by the US Atomic Energy Commission, who sought to model the societal consequences of mass mortality caused by nuclear war. In addition to the measles epidemic, Tierney charged that Chagnon mischaracterized the Yanomami as "The Fierce People" when in fact it was Chagnon who was causing the violence by introducing enormous amounts of western goods such as machetes into the Yanomami society, thus stimulating warfare over the introduced goods. Tierney also accused Chagnon of fraud by staging films, such as "The Axe Fight" that he helped produce. The journalist charged that the anthropologist prescripted the films and that they were not spontaneous as portrayed.

Tierney's book caused an uproar in the anthropological community and the American Anthropological Association (AAA) got involved in the debate. In fact, the AAA convened a special commission to investigate the allegations against Chagnon and Neel. The report by the AAA issued in May, 2002 exonerated the anthropologist and geneticist from causing a measles epidemic among the Yanomami. Nonetheless, the AAA criticized some aspects of Chagnon's research, including his portrayal of the Yanomami as "The Fierce People," and his bribing of Venezuelan officials. However, the AAA debate was not over and three years later in June, 2005 they rescinded the acceptance of the 2002 report.

As someone who is working to support indigenous people, I would like to point out that over the many years since publishing his first book on the Yanomami (whose revenues made him a millionaire), Chagnon has failed to bring significant aid to the Yanomami people. In fact, he sought to damage the indigenous movement by publicly criticizing Davi Kopenawa, a Yanomami activist who helped establish the Yanomami reserve in Brazil. One might ask if it was proper behavior for an anthropologist to hurt the efforts of an indigenous Amazonian activist attempting to defend his people. Interestingly, the Yanomami leader Davi Kopenawa has predicted the destruction of the entire human race if the Amazon Rainforest is destroyed. Kopenawa states, "The forest-land will only die if it is destroyed by whites. Then, the creeks will disappear, the land will crumble, the trees will dry and the stones of the mountains will shatter under the heat. The xapiripë spirits who live in the mountain ranges and play in the forest will eventually flee. Their fathers, the shamans, will not be able to summon them to protect us. The forest-land will become dry and empty. The shamans will no longer be able to deter the smoke-epidemics and the malefic beings who make us ill. And so everyone will die." Many ecologists seem to agree with Kopenawa, believing that the Amazon Rainforest are the "lungs of the Earth" and that if the Amazon is destroyed, it will cause a global ecological disaster resulting in the eventual destruction of the human race.

#### Antarctic mining causes conflict---goes nuclear

David W. Floren 1, J.D. from the University of Oregon, “Antarctic Mining Regimes: An Appreciation of the Attainable”, Journal of Environmental Law and Litigation, Fall, Volume 16, Number 2, 467-513

Concern for the quality of the environment provides a great reason for a mining moratorium, but additional justifications exist. Critics of CRAMRA worry about Antarctica becoming a "scene [or] object of international discord." n221 Largely ignored in the ATS debate is the real danger an introduction of mining and fossil fuel facilities and infrastructure would pose to the integrity of the peacekeeping goals of the ATS. n222 Such facilities and their transportation mechanisms (pipelines, tankers, etc.) will be important targets for destruction or seizure during any armed conflict involving any nation reliant on Antarctic mineral and fossil fuel resources. Article I bans, "inter alia, any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military maneuvers, as well as the testing of any type of weapons." n223 Although mining qua mining is clearly not military in nature, the simple existence of mining facilities necessarily entails certain consequences. The history of armed conflict shows the increasingly vital role played by mineral and energy resource facilities in sustaining wartime economies. n224 Such facilities have always been selected as priority targets in military planning and strategy sessions, and the absence of major civilian targets in Antarctica further emphasizes the focus on mining facilityes. Target status is inseparable from the existence of productive mining and fossil fuel facilities, n225 and target priority grows with [\*504] distance from large human population centers. n226 Compounding this problem is the possibility that nuclear weapons might be used. The remoteness and inaccessibility of targets in the AT Area, n227 combined with the tiny number of anticipated human casualties boosts the likelihood that tactical nuclear weaponry would be engaged to achieve top military priorities, despite AT obligations n228 and other international accords discouraging their use. n229

### Collision

#### No cascades:

#### Space is too big for frequent collisions---debris is spread widely across multiple huge planes and small objects quickly deorbit, clearing space. It’d take centuries to snowball, but adaptation solves first: intervening controls coming online check debris.

#### Amounts will increase only 30% after 200 years, assuming zero mitigation

Hugh Lewis 15, Senior Lecturer in Aerospace Engineering at the University of Southampton, Member of the UK Space Agency delegation to the Inter-Agency Space Debris Coordination Committee and Member of the UK delegation to the United Nations Committee on the Peaceful Uses of Outer Space, “Space Debris, Kessler Syndrome, and The Unreasonable Expectation of Certainty”, ROOM The Space Journal, Issue #3(5), October, https://room.eu.com/article/Space\_debris\_Kessler\_Syndrome\_and\_the\_unreasonable\_expectation\_of\_certainty

There is now widespread awareness of the space debris problem amongst policymakers, scientists, engineers and the public. Thanks to pivotal work by J.C. Liou and Nicholas Johnson in 2006 we now understand that the continued growth of the debris population is likely in the future even if all launch activity is halted. The reason for this sustained growth, and for the concern of many satellite operators who are forced to act to protect their assets, are collisions that are expected to occur between objects – satellites and rocket stages – already in orbit. In spite of several commentators warning that these collisions are just the start of a collision cascade that will render access to low Earth orbit all but impossible – a process commonly referred to as the ‘Kessler Syndrome’ after the debris scientist Donald Kessler – the reality is not likely to be on the scale of these predictions or the events depicted in the film Gravity. Indeed, results presented by the Inter-Agency Space Debris Coordination Committee (IADC) at the Sixth European Conference on Space Debris show an expected increase in the debris population of only 30% after 200 years with continued launch activity.

Collisions are still predicted to occur, but this is far from the catastrophic scenario feared by some. Constraining the population increase to a modest level can be achieved, the IADC suggested, through widespread and good compliance with existing space debris mitigation guidelines, especially those relating to passivation (whereby all sources of stored energy on a satellite are depleted at the end of its mission) and post-mission disposal, such as de-orbiting the satellite or re-orbiting it to a graveyard orbit. Nevertheless, the anticipated growth of the debris population in spite of these robust efforts merits the investigation of additional measures to address the debris threat, according to the IADC.

#### Collisions are unlikely because all debris is moving in the same direction, at the same speed

Michael McClennen 18, Research Informaticist in the Department of Geoscience at the University of Wisconsin-Madison, “With So Many Satellites and Space Junk Floating Around the Earth, How Is It That There Are Not Very Many of Them Colliding With One Another or Crashing Into The Space Station or Even New Ships Sent Into Space?”, Quora, 10/10/2018, https://www.quora.com/With-so-many-satellites-and-space-junk-floating-around-the-earth-how-is-it-that-there-are-not-very-many-of-them-colliding-with-one-another-or-crashing-into-the-space-station-or-even-new-ships-sent-into-space

In addition to the other answers, there is another very important factor. A large majority of the orbiting objects (both satellites and debris) are all going in roughly the same direction around Earth, in the same direction as Earth’s rotation with an orbital inclination of between 0º and 22º with respect to the equator. This is due primarily to the fact that launching due East is more efficient than launching in any other direction, and allows you to use the least amount of fuel in getting your payload to orbit. In addition, the laws of physics mandate that all of the objects at a given orbital altitude are moving at roughly the same speed. These basic facts substantially lower the chances of collision. As these objects all move around the globe, they are roughly keeping station with respect to most of the other objects at the same altitude.

There is, of course, another group of satellites and debris that are moving in polar orbits, which are roughly perpendicular to the the mostly-equatorial orbits I discussed in the previous paragraph. These satellites and most of their associated debris were deliberately placed into orbit at a different range of altitudes from the equatorially-orbiting satellites, specifically so that the two populations of objects would not crash into each other.

So it is not the case that the tracks of orbiting objects randomly cross in all directions. Rather the ones at any given altitude are (mostly) moving in the same direction and at roughly the same speed. This has helped quite a bit to keep the orbital-debris situation tolerable so far.

### Capitalism

#### Extinction outweighs and is a prereq – if people aren’t alive then cap has zero impacts – we control the link chain.

#### The aff doesn’t change this – not only space companies are using private entities – nothing changing.

#### There is no terminal impact – reject this argument since there is no real impact for the argument.

## 2nr

#### The DA leads to extinction from Congres not signing the deal because space policy pushes it back – that ruins a yearlong military monitizarition – in turn it leads to cyber and deterrence crash.

#### That turns and outweighs the case for 5 reasons.

#### Magnitude – its an extinction level threat – everyone dies means it outweighs on severity and scope since no one is alive after the DA and it is a complete whipe out.

#### Probability – it is going to happen – prefer our evidence since it is literally written this week which puts their evidence as non-important – this is actually going to prevent the bill from passing.

#### Timeframe – it happens now – the bill isn’t going to be passed now because of space policy – that pushes it passed the brink and the DA happens before the affs impacts can happen – so it’s a prereq

#### Reversability – it is a full out extinction scenerio – no going back – that kills everyone – biggest impact in the round

#### That turns case –

#### Since our impact happens first it controls the direction of the DA – if we win timeframe

#### Lack of cyber and deterrence crash is the biggest problem – we solve for it and solve for the case’s impacts

#### Space policy directly leads to our impact – their impacts have multiple alt causes so if we win our link we directly turn the case.