# Palm R5

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## Framing

**Permissibility and presumption affirm:**

1. **Epistemics – we wouldn’t be able to start a strand of reasoning since we’d have to question that reason – means that presuming neg is incoherent because it relies on some presumptive truths about justice and the world in general**
2. [**Unjust**](https://www.dictionary.com/browse/unjust) **is defined as “not just; lacking in justice or fairness:” so if something is neither good or bad, then it is not just which proves it is unjust**
3. **Probability - Logically safer since it’s better to be supererogatory than fail to meet an obligation**
4. **Logic - If everything is permissible so is the aff since nothing prevents us from doing it**
5. **Intuition - we naturally believe statements true e.g. if I told you my name is Shrey, you’d believe me**

**Perspectivism is true–**

1. **Opacity – we can never access another person’s perspective because we can never fully understand who someone else is or what they think. Every truth I create cannot be universalized because I can’t guarantee that they will create the same truth because they do what they want**
2. **Linguistics – Truth is constructed by language, which is completely arbitrary. Nothing tells me that a chair is a chair; I only assign it that name arbitrarily because I want to. Meaning can’t be contained within language if we make it up ourselves, and truth doesn’t exist absent language**

**Truth is not foundational and morality can only gain coherence through intersubjective social norms. Deliberation must be constitutive of normative reasoning since it’s necessary to validate the acceptance of any syllogism–other theories rely on communication to properly interpret and follow them and communicate an obligation**

**Habermas** (Jurgen, Moral Consciousness and Communicative Action, **1983**)

This "fact of reason" cannot be deductively grounded} but 11:can be clarified if we take the further step of conceiving argumentative speech as a special case-in, fact, a pnvlleg~d derivative of action oriented toward reaching understanding. Only when we return to the level of action theory and conceivediscourse as a continuation of communicative action by other means can we understand the true thrust of discourse ethics. The reason we can locate the content of (U) in the communicative presuppositions of argu~en.tation .is that argumentation is a reflective form of communicative action and the structuresof action oriented toward reaching understanding always alreadypresuppose those very relationships of, reciprocity and mutual recognition around which all moral ideas revolve In everyday life no less than in philosophical ethi:s. Like Ka~t'sappeal to the "fact of reason," this thrust of discourse ethics has a naturalistic ring to it, but it is by no means a naturalistic fallacy. Both Kant and the proponents of discourse ethics rely on a type of argument that draws attention to the inescapability of the general presuppositions that always already under the the communicative practice of everyday life and that cannot be picked or chosen like makes of cars or value postulates. This type of argument is made from the reflective point of view, not from the empiricist attitude of an objectivating observer.The transcendental mode of justification reflects the fact that practical discourse is embedded in contexts of communicative action. To that extent discourse ethICS pOInts to, and ltselfdepends upon, a theory of con:municative act~on. We can expecta contribution to the vertICal reconstructIo~ o~ stage~ of moral consciousness from the theory of communIcatlve actIOn, for the latter focuses on structures of linguistically mediated, norm-governed Interaction, structures that integrate what psychology analytically separates; to wit, perspective taking, moral Judgment, and action.

**Thus, the standard is consistency with pragmatic constraints–a method of pluralism that a] hijacks every other framework since only we can situate ideas into habit through practice and b] is self correcting and can build upon itself to infinitely improve and be better than any other framework, which also mean responses don’t link since prag can fix them in the future**

**Serra 09** Juan Pablo Serra. What Is and What Should Pragmatic Ethics Be? Some Remarks on Recent Scholarship*.* EUROPEAN JOURNAL OF PRAGMATISM AND AMERICAN PHILOSOPHY. 2009. Francisco de Vitoria College, Humanities Department, Faculty member. https://journals.openedition.org/ejpap/905

This separation of theory and practice runs parallel to another split, namely, that of ethics and morals or, better put, of ethical theory and moral practice. Peirce denies that morality is subject to rationality and thinks that ethics is valuable as a science in a broad sense. But he also regards ethics as a science which bears on human conduct only indirectly, through the examination of past actions and the self-correction of the self in view of future action. In addition, ethics would be a normative knowledge only in so far as it analyzes the adjustment of actions to ends and in so far as it studies the general way in which a good life can be lived. In morals Peirce appeals to instinct and sentiment, and in ethics he recommends the use of logical thinking —just as scientists do. However, even within the framework of his system, it’s not obvious that scientists may so easily set aside their instincts —in fact, instinct (or ‘rational instinct’ as he called it in 1908) plays a significant role in the economy of re- search. Moreover, the statement that in moral issues there may be no possibility of carrying out an inquiry that is truth-oriented is not an uncontroversial one. After all, moral inquiry is performed in a deliberative way, weighing up argumentations, beliefs and principles, and comparing them either with their probable or conceivable consequences or with lived as well as possible experiences that can be forceful or impinge upon the deliberative subject in such a way as to acquire the compulsory resistance due to reality. As Misak puts it succint- ly, “the practice of moral deliberation is responsive to experience, reason, argument, and thought experiments... Such responsiveness is part of what it is to make a moral decision and part of what it is to try to live a moral life” (2000: 52)3. Likewise, this same deliberative activity implies an effort to acquire habits, beliefs and principles that contribute to a truly free deliberation which, in turn, can result in creative conclusions. For Peirce, as you get more habit-governed, you become more creative and free, and your selfhood acquires plas- ticity and receptiveness to experience4. Vincent Colapietro has referred to Peirce’s description of human reason in terms of a deliberative rationality (1999: 24). Also, in another place he has explained that deliberation for Peirce is a process of preparation for future action which has to do with the checking of previous acts, the rehearsal in imagination of different roads to be followed by possible conduct and the nurturing of ideals (Colapietro 1997: 270, 281). It is precisely this experi- ment carried out within imagination that generates habits, because, as Peirce says in “A Survey of Pragmaticism”, “it is not the muscular action but the accompanying inward ef- forts, the acts of imagination, that produce the habit” (CP 5.479, 1907). Habits are regular ways of thinking, perceiving and interpreting that generate actions. As such, habits have a huge influence on human behavior, manifest themselves in the con- crete things we do and, at the same time, are formed within those same activities. Even more, according to Peirce, the activity takes the form of experimentation in the inner world; and the conclusion (if it comes to a definite conclusion), is that under given conditions, the interpreter will have formed the habit of acting in a given way whenever he may desire a given kind of result. The real and living logical conclusion is that habit (CP 5.491, 1907). Much more evidence could be given to support the view that habits are virtually decided (CP 2.435, c.1893) and also that intelligence comprises inward or potential actions that in- fluence the formation of habits (CP 6.286, 1893). Suffice it to say that, according to Peirce, deliberation is a function of the imagination, and that imagination is in itself an experiment which may have unexpected consequences that impose themselves upon the deliberative subject.

**Impact calc -**

1. **Deliberation plays a procedural, not substantive role in pragmatic tradition. It doesn’t say which impacts matter the most nor is it an impact to weigh, but tells us *what* questions to ask and how we determine the answers to them. This is a sequencing question - we are first concerned with the decisionmaking procedure to evaluate whether other metrics such as consequences even matter**
2. **Consequentialism fails - a] Induction fails – the logic of looking to the past to predict the future is all premised in the past, so it’s circular b] Aggregation fails – there’s no way to weigh between different forms of pain and pleasure e.g. 5 headaches vs a migraine c] Butterfly effect – each consequence has a future consequence and so on so we never know if it really did net good d] Subjectivity - everyone takes pleasure and pain in different things so we can’t know what maximizes it e] Infinite universe has infinite pleasure and pain - to add a finite amount does nothing because infinity + finity is still infinity f] Culpability -- can’t be held responsible for consequences because we can’t know all of them and it’s out of our control, intents are the only verifiable basis**
3. **Use epistemic modesty - no framework is 100% true which means we have to weigh between the correctness of each framework since 45 minutes isn’t enough to resolve thousands of years of debate. Offense under pragmatism outweighs - a] pragmatism is definitionally epistemic modesty since we include a pluralism of frameworks, so offense under my framework is procedural offense under epistemic modesty itself b] my framework encompasses the values of infinite different frameworks through deliberating between them which has infinite magnitude by incorporating offense from under every theory**
4. **Because we cannot know whether moral judgements are infinitely true, we need to solve problems in our specific context. Therefore, if I prove the res affirms in the context of my framework, any reason to negate functions in a different context and isn’t a reason not to affirm**

**Prefer additionally:**

1. **Performativity–responding to my framework concedes it because you are deliberating against it – outweighs because morality must prevent opting out which only constitutivism solves**
2. **Probability - disagreement is rife in the squo so most theories are wrong - prefer relative reliability. The law of large numbers proves when we test more it gets closer to true probability so when we test theories under this fw we’ll get the best calculus. This means a] even if my framework is wrong, its non-unique since it also encompasses their framework so if ours is wrong, then every framework is wrong and b] we take the premises of many theories’ claims into practice and use them in the best instances which non-uniques any net benefits to other theories**
3. **Rule Following Paradox - There is nothing inherent to a rule that tells us how we ought to follow it, which proves no internal motivation or direction to follow a particular rule, regardless of how correct the rule is. Since only our interpretation can tell us how to follow the rule, there can be no incorrect application. Only deliberation accounts for the diversity of interpretations of our norms - any other theory is illegitimate since it hasn’t been socially accepted by the people yet**
4. **Limits–ethics are limited to how we conceptualize them–the way we cohere and understand ethics changes as we learn more about the world–only a theory that can account for new unforeseen circumstances create the most ethically rigorous solution**

**LaFollete 2K** "Pragmatic Ethics" [Hugh LaFollette](http://www.hughlafollette.com/index.htm) In [Blackwell Guide to Ethical Theory](http://www.hughlafollette.com/papers/b-guide.htm) 2000. Hugh LaFollette is Marie E. and Leslie Cole Professor in Ethics at the University of South Florida St. Petersburg. He is editor-in-chief of The International Encyclopedia of Ethics. Dulles AS

Pragmatic ethics takes a more aggressive approach, insisting that mankind is responsible for determining the best ethical system possible, which will be refined as new discoveries are made. Put simply; truth does not exist in some abstract realm of thought independent of social relationship or actions; instead, the truth is a function of an active … Pragmatism, according to William James, is derived from the Greek word pragma, which means action and serves as the basis of our English words practical and practice. Pragmatism originated in the United States around 1870, and now presents a growing third alternative to both analytic and Continental philosophical traditions worldwide. 1 - Acceptance . Ethics is a branch of philosophy that is responsible for studying the principles that govern the conduct of an individual. Employs criteria, but is not criterial The previous discussions enable us to say more precisely why pragmatists reject a criterial view of morality. Pragmatism's core contention that practice is primary in philosophy rules out the hope of logically prior criteria. Any meaningful criteria evolve from our attempt to live morally – in deciding what is the best action in the circumstances. Criteria are not discovered by pure reason, and they are not fixed. As ends of action, they are always revisable. As we obtain new evidence about ourselves and our world, and as our worlds changes, we find that what was appropriate for the old environment may not be conducive to survival in the new one. A style of teaching that might have been ideal for one kind institution (a progressive liberal arts college) at one time (the 60s) may be wholly ineffective in another institution (a regional state university) at another time (the 80s). But that is exactly what we would expect of an evolutionary ethic. Neither could criteria be complete. The moral world is complex and changeable. No set of criteria could give us univocal answers about how we should behave in all circumstances. If we cannot develop an algorithm for winning at chess, where there are only eighteen first moves, there is no way to develop an algorithm for living, which has a finitely large number of "first moves." Moreover, while the chess environment (the rules) stays constant, our natural and moral environments do not. We must adapt or fail. While there is always one end of chess -- the game ends when one player wins – the ends of life change as we grow, and as our environments change. Finally, we cannot resolve practical moral questions simply by applying criteria. We do not make personal or profession decisions by applying fixed, complete criteria. Why should we assume we should make moral decisions that way? Appropriates insights from other ethical theories Nonetheless, there is a perfectly good sense in which a pragmatic ethic employs what we might call criteria, but their nature and role dramatically differ from that in a criterial morality (Dewey 1985/1932) . Pragmatic criteria are not external rules we apply, but are tools we use in making informed judgements. They embody learning from previous action, they express our tentative efforts to isolate morally relevant features of those actions. These emergent criteria can become integrated into our habits, thereby informing the ways that we react to, think about, and imagine our worlds and our relations to others. This explains why pragmatists think other theories can provide guidance on how to live morally. Standard moral theories err not because they offer silly moral advice, but because they misunderstand that advice. Other moral theories can help us isolate (and habitually focus on) morally relevant features of action. And pragmatists take help wherever they can get it. Utilitarianism does not provide an algorithm for deciding how to act, but it shapes habits to help us "naturally" attend to the ways that our actions impact others. Deontology does not provide a list of general rules to follow, but it sensitizes us to ways our actions might promote or undermine respect for others. Contractarianism does not resolve all moral issues, but it sensitizes us to the need for broad consensus. That is why it is mistaken to suppose that the pragmatist makes specific moral judgements oblivious to rules, principles, virtues, and the collective wisdom of human experience. The pragmatist absorbs these insights into her habits, and thereby shapes how she habitually responds, and how she habitually deliberates when deliberation is required. This also explains why criterial moralities tend to be minimalistic. They specify minimal sets of rules to follow in order to be moral. Pragmatism, on the other hand, like virtue theories, is more concerned to emphasize exemplary behavior – to use morally relevant features of action to determine the best way to behave, not the minimally tolerable way

1. **Actor Spec - Only a radical democracy that constantly questions its own foundations can ever be open to radical revision – other systems insist on their own foundation even when that’s exclusionary or illegitimate. The aff is a better model for constructing a political institution that must secure its own legitimacy over time and to changing groups of citizens.**
2. **Ethical Uncertainty - If you’re unsure what the good is, allow for deliberation because it allows people to pursue their conception of the good and discuss it.**

## Offense

**I defend the resolution as a value statement and a general principle, which means specific instances that the aff is wrong don’t disprove our general thesis, just as penguins don’t disprove birds fly. Cx and before round check all interps to deter frivolous theory and maximize substance. Affirm:**

**[1] The appropriation of space by private entities isn’t value neutral but is sutured in a discourse of the cosmic elite and unequal IR.**

**Stockwell 20** [Samuel Stockwell (Research Project Manager, the Annenberg Institute at Brown University). “Legal ‘Black Holes’ in Outer Space: The Regulation of Private Space Companies”. E-International Relations. Jul 20 2020. Accessed 12/7/21.<https://www.e-ir.info/2020/07/20/legal-black-holes-in-outer-space-the-regulation-of-private-space-companies/> //Xu]

The US government’s support for private space companies is also likely to lead to the reinforcement of Earth-bound wealth inequalities in space. Many NewSpace actors frame their long-term ambitions in space with strong anthropogenic undertones, by offering the salvation of the human race from impending extinction through off-world colonial developments (Kearnes & Dooren: 2017: 182). Yet, this type of discourse disguises the highly exclusive nature of these missions. Whilst they seem to suggest that there is a stake for ordinary citizens in the vast space frontier, the reality is that these self-described space pioneers are a member of a narrow ‘cosmic elite’ – “founders of Amazon.com, Microsoft, Pay Pal… and a smattering of games designers and hotel magnates” (Parker, 2009: 91). Indeed, private space enterprises have themselves suggested that they have no obligation to share mineral resources extracted in space with the global community (Klinger, 2017: 208). This is reflected in the speeches of individuals such as Nathan Ingraham, a senior editor at the tech site EngadAsteroid mining, who claimed that asteroid mining was “how [America is] going to move into space and develop the next Vegas Strip” (Shaer, 2016: 50). Such comments highlight a form of what Beery (2016) defines as ‘scalar politics’. In similar ways to the ‘scaling’ of unequal international relations that has constituted our relationship with outer space under the guise of the ‘global commons’ (Beery, 2016: 99), private companies – through their anthropogenic discourse – are scaling existing Earth-bound wealth inequalities and social relations into space by siphoning off extra-terrestrial resources. By constructing their endeavours in ways that appeal to the common good, NewSpace actors are therefore concealing the reality of how commercial resource extraction serves the exclusive interests of their private shareholders at the expense of the vast majority of the global population.

**[2] Appropriation is intrinsically exclusive and denies experimentation and guts deliberative procedures by creating permanent, unchanging bounds that exclude communal deliberations over certain regions through exclusivity**

Timothy Justin **Trapp**, JD Candidate @ UIUC Law, **’13**, TAKING UP SPACE BY ANY OTHER MEANS: COMING TO TERMS WITH THE NONAPPROPRIATION ARTICLE OF THE OUTER SPACE TREATY UNIVERSITY OF ILLINOIS LAW REVIEW [Vol. 2013 No. 4]

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

**[3] The process of taking control over space is a form of claiming ownership over things like extra-terrestrial life rather than deliberating over methods of shared ownership**

Benjamin **Segobaetso** [Project Officer at United Nations Association in Canada]. “Ethical Implications of the Colonization, Privatization and Commercialization of Outer Space” uOttawa. May **2018**. <https://ruor.uottawa.ca/bitstream/10393/38318/1/Benjamin\_Segobaetso\_2018.pdf> [AD]

It can be argued through Kantian ethics that our record here on Earth paints a picture of neoliberal and capitalist policies with tendencies to favour the highest bidder at the exclusion of the under privileged and puts profit first at the expense of the environment. For Kantians, there are two questions that we must ask ourselves whenever we decide to act: (i) Can I rationally will that everyone act as I propose to act? If the answer is no, then we must not perform the action. (ii) Does my action respect the goals of human beings? Again, if the answer is no, then we must not perform the action. Kantian ethicists would argue that extending to space neoliberal and capitalist policies is immoral because these systems create economic disparities and life threatening environmental injustices; therefore, they are set up in a way that we could not rationally will everyone to act the way they act either here on Earth or in space. Also, Kantian ethicists would ask whether the action of extending neoliberal and capitalist policies to space would respect the goals of extra-terrestrial intelligent life if any rather than merely using them for humans’ own purposes? If the answer is no, then the participating agent must not perform the action. Kant wrote on the possible existence of extra-terrestrial intelligent species in the final pages of the last book that he published, Anthropology from a Pragmatic Point of View [Anthropologie in pragmatischer Hinsicht] (1978). In this publication, Kant hinted that the highest concept of the Alien species may be that of a terrestrial rational being [eines irdischen vernünftigen ]; however, he argued that it will be difficult to describe its characteristics because there is no knowledge available of a non-terrestrial rational being [nicht irdischen Wesen] which could be used as a reference in regards to its properties and ultimately classify that terrestrial being as rational. This dilemma will continue until extraterrestrial intelligent life is discovered because comparing two species of rational beings has to be on the basis of experience, but that experience has not been possible yet (Kant, 237-238). In applying Kant’s deontological moral theory, it must first be recognized that Kant visualized a kind of respect in which we all can recognize every rational being exists as an end in itself (1) as being not fully comprehensible by any human understanding, (2) as being an end in him- or herself, and (3) as being a potential source of moral law (Kant, 2012). In this regard, since Kant insinuated that the highest concept of the extraterrestrial intelligent species may be that of a terrestrial rational being [eines irdischen vernünftigen ]; that implies any encounter with extra-terrestrial intelligent life will compel us under the deontological moral theory to recognize that life as being not fully comprehensible by any human understanding, as being an end in itself, and as being a potential source of moral law (Kant, 2012). . In this regard, since Kant insinuated that the highest concept of the extraterrestrial intelligent species may be that of a terrestrial rational being [eines irdischen vernünftigen ]; that implies any encounter with extra-terrestrial intelligent life will compel us under the deontological moral theory to recognize that life as being not fully comprehensible by any human understanding, as being an end in itself, and as being a potential source of moral law (Kant, 2012). It must be realized that Kant’s deontology theory does not go without criticism by critical theorists who believe in dismantling all systems of oppression.

## Advantage

**Space race coming now and escalates conflict**

**Delgado-Perez 20** [Veronica Delgado-Perez, staff contributor to International Scholar with a Master’s degree in Public International Law from Utrecht University and a Bachelor of Laws at the Universidad Externado de Colombia, with a focus on soviergnty and outer space law, 4-6-2020, "Commercialization of Space Risks Launching a Militarized Space Race," International Scholar, <https://www.theintlscholar.com/periodical/12/14/2020/analysis-commercialization-space-risk-international-law-military-space-race>]/Kankee

International law must immediately and proactively address questions surrounding extraterrestrial commercial activity — or risk the unraveling of the international legal neutrality of space and the launch of a new militarized space race fueled by resurgent great power competition. On April 6, 2020, U.S. former President Donald Trump announced an executive order encouraging the use and recovery of space resources, which includes hard rock minerals, helium, and regolith, among others. The order argued that outer space was not a "global commons," as is established in international law, but rather that space is considered as public and private property within the limits of applicable law. The private commercialization of resources in outer space was long a goal of the Trump administration. However, President Biden’s space policies are much more speculative given the lack of information about his views on outer space. There is only one document from the Democratic Party, titled “Building a Stronger, Fairer Economy,” which hints at a Biden administration approach to space interests. According to the platform, the Democratic Party remains committed to continuing space exploration and supporting NASA’s programs.Following Trump’s decision, SpaceX launched the Crew Dragon with NASA astronauts to the International Space Station (ISS) on May 30, 2020. Though in years past, NASA chose state-owned Russian rockets to send astronauts to outer space, the Crew Dragon is a rocket built, operated, and launched by a private American company. In the same month, NASA announced the Artemis Accords, which establish a new set of principles including the extraction and use of resources on the Moon, Mars, and asteroids. The commercial crew program appears to remain in operation, launching its first operational flight of the Crew Dragon by Space X on November 16th of this year. While nonetheless a remarkable technical achievement, the Crew Dragon’s mission, and the policies that enabled it, will inevitably lead to a drawn-out geopolitical and legal conflict. The U.S.’ commercial activities could violate several international instruments and ignore U.N.’s resolutions, compromise a vital foundation of international law, weaken the U.S.’ standing and respectability around the world, and undermine the principle of maintaining international peace and security and promoting international cooperation and understanding, all while fueling a new space race between the world’s great powers. For all of these reasons, every effort should be made to foster an international response to the U.S. policy and to shore up international legal mechanisms to prevent the commercialization of space. Fundamentals of the Final Frontier It is a geopolitical imperative to determine what, if any, commercial activities and use of extraterrestrial resources are permitted within the confines of international law. Without clear-cut agreements on what activity is recognized by international law, the world will undoubtedly see states push the boundaries ever further in an attempt to gain the edge over geopolitical competitors — even more-so in an era of renewed great power competition. Yet to date, there exists no comprehensive treaty or legal reference to commercial activity in space. However, this should come as no surprise. It has only been since the turn of the century that technology and markets have progressed to the point where commercial space exploration and exploitation has become possible. Only recently have experts and analysts of geopolitics and international law begun to seriously examine questions surrounding the legal framework that would govern extraterrestrial resource-mining and other commercial activities. In the last decade, the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) dealt with commercial aspects in outer space. In one of their last reports, the Committee expressed that the era of the commercial utilization of outer space’s resources is intrinsically linked to the escalation of international competition over resources, which could threaten international peace and security. By encouraging the international community to engage in outer space’s activities for the benefit of humankind as a whole, “some delegations” have expressed that states should avoid the promotion of laws and regulations related to the commercialization of outer space, arguing that it should be considered the heritage of all humanity. In that regard, states must then ensure that domestic law on the use of outer space complies with international space law, which means that states should respect the principles outlined in the Outer Space Treaty and ensure that national regulations do not contravene international provisions. Even though the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (which entered into force in 1967), refers to the exploration and use of outer space, it does not address questions of a commercial nature, which compromises the ability of states and international actors to address new challenges to extraterrestrial activities. In several provisions, the treaty highlights that these activities may be carried out for peaceful purposes and the benefit of all people, reaffirming that outer space is not subject to national appropriation. Were outer space not considered a global commons, that would imply that the resources and results of commercial exploration may fall within the jurisdiction of a country. It is thus incumbent upon Washington — and its commercial enterprises — to demonstrate how American commercial exploration of space benefits other countries and complies with international space law, or otherwise to adhere to the spirit of past treaties which emphasize the impartiality of outer space until such time as the law is clarified. International Law is Adrift in Space The potential benefits of commercial space exploration cannot be ignored. From an economic standpoint, the space industry would generate a significant economic boon for both states and private companies, due to the abundance and variety of resources — particularly scarce minerals that are difficult to extract on Earth. As one example of the vastness of resources held in outer space, one asteroid has the potential to contain more than the total supply of platinum extracted throughout the history of mankind. It may very well open the door to an advanced era of space navigation, building extraterrestrial infrastructure that facilitates the exploration and use of space’s resources, and extra-planetary human habitation. Inevitably, there are significant drawbacks to the commercialization of space exploration. These can vary, for instance, from the commercial dominance of space’s natural resources only by those states with the technical and financial capital to support space missions, to geopolitical competition over extraterrestrial resources that threatens world peace and security, to the potential for the monopolization of extraterrestrial resources by states and private companies. As was the case during the Cold War, the Soviet Union and the United States began a Space Race in which they struggled to achieve supremacy in space exploration and domination of science. Today, the number of space powers has increased thanks to continual advancements in flight, combustion, and fueling technologies. In the three decades since the end of the Cold War, technologically advanced countries like China, Japan, and France which previously had no space program have successfully navigated to the top tier of space-faring agencies and programs. In 2018, the U.S. allocated $41 billion to space programs, followed by China at $5.8 billion, and Russia at $3.1 billion. Collectively, the three major space powers control almost 65% of the global industry, showing space powers are monopolizing space and reinforcing the inequality gap between states that do not have sufficient economic and technological capacity to invest. With new actors on the game stage, conflicts of interest may arise. There is a risk that each actor adopts a kind of short-term Realist approach to space policy — one which is driven by self-interest in reaping the greatest benefits of extraterrestrial exploration and commercialization while controlling access to others. If unmitigated, states may choose to militarize outer space to gain a strategic edge over competitors and adversaries. This process has already begun. Under the Trump administration, the Pentagon established the U.S. Space Force as a new branch of the Armed Forces to protect the country and allied interests in space. Already, Delta 4 — one of the U.S. Space Force’s missions — conducts strategic and theater missile warnings, manages weapon systems, and provides information to missile defense forces. The measure shows that for the U.S., outer space is not only a domain of scientific exploration but has the potential to become increasingly securitized. With the impending expiration of the Strategic Arms Reduction Treaty (START) between the U.S. and Russia on February 5, 2021, a number of security dilemmas could arise. If the world’s two largest nuclear powers do not edge toward extending the treaty, Washington and Moscow risk returning to the era of unrestricted expansion of launch platforms and strategically-deployed nuclear warheads — potentially with the aid of military infrastructure in space. Although President-elect Biden has expressed his interest in negotiating an extension of New START, how Moscow and Washington might proceed remains an open question. Bilateral progress towards a new arms-control regime would require establishing limits on the number and range of long- and mid-range missiles, establishing measures to limit the expansion of traditional missile deployment to space, and banning the deployment of nuclear weapons and weapons of mass destruction in outer space. More than the risk of the securitization of space, state, and private actors could begin to claim exclusive legal rights over the resources they discover. Indeed, the U.S. Commercial Space Launch Competitiveness Act, which came into force in 2015, expressly recognizes the right of U.S. Citizens to possess, own, transport, use, and sell space resources. By this means, domestic law already acknowledges the legal claim to property by individuals, which is prohibited by international law. Under the Outer Space Treaty, states renounced any traditional form of acquisition of territories and agreed not to foray unilaterally into space to extend their national policies on Earth or to exercise any kind of sovereignty over celestial bodies or resources. The absence of a modern international treaty that addresses these issues should be received with grave concern, as there is significant potential for risk to become reality. Existing UN treaties lack the technological context and foresight to address legal questions regarding the potential for commercial exploration and exploitation of outer space or its resources. During the sixties and seventies, when international instruments like the Outer Space treaty were conceived, the principal aim of states was to support and expand the scale of the state’s national capacity for operation in space and the development of legal instruments to guide state’s international cooperation in the peaceful exploration of outer space. These instruments were never designed to respond to commercial questions over mining or tourism in space, private investment in space activities, or the emergence of non-state private enterprises operating in space. As a result, private enterprises operating in the vacuum of space also float in an unstable legal vacuum which threatens to implode in geopolitical competition. Beyond Stars and States In an increasingly commercial outer space in which there are no set limits to the exploitation of resources or claim to property, states and private companies will inevitably pursue the development of new extraterrestrial industries to suit their geoeconomic interests. If unchecked, the legal protection of outer space as a domain of exploration for the benefit of all humanity would functionally fail. To protect investments and profit from national space industries, states would likely resort to military force to protect and secure private assets. Over time, space would ultimately become a fourth border domain over which states claim, exercise, and defend sovereignty — including through the use of force. The challenge is thus to prevent the circumstances that could lead to space-borne conflict before it is made possible. Notwithstanding, commercial exploration and the use of natural resources need not lead to predation among actors involved in space. The potential rewards — both technological and environmental — that could come from investment in the harvesting of resources in space are immense. International law cannot afford to wait for the security dilemma posed by commercial activity in space to manifest before addressing it but must anticipate and proactively adopt measures to address future issues that govern extraterrestrial human activity. The only remedy for the lack of legal governance over commercial activity in space is the creation of new international laws through a comprehensive international treaty on commercial operations in space. The new treaty must expressly regulate commercial activities by states and private companies, enshrine an international liability and compensation regime covering damages caused with workable sanction provisions, and reinforce norms that restrict any militarization of outer space. The international community should focus its efforts on establishing a legal regime, with mandatory provisions (rather than non-binding resolutions, observations, commentaries, and conclusions) which generate both international responsibility and provide enforceable sanctions in the event of violations. The effort should be borne out by expanding the scope and strengthening the oversight powers of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), rather than creating a new organ with redundant bureaucracy. Beyond the tasks of encouraging space research programs, studying space activities, and addressing legal questions, COPUOS should be granted the necessary powers to perform control and oversight monitoring functions. Experience has taught the international community that cooperative arrangements between states and international organizations can prevent competition for resources from escalating to kinetic conflict. Through cooperation, there is a chance to preserve extraterrestrial resources for future generations, secure an equitable allocation of resources and benefits with a mind to each country’s specific needs, and prevent the expansion of geopolitical conflict to the domain of space. Space powers must recognize the value in partnering with other states to advance the development of space programs more efficiently. It should be clear now that all nations could reap the benefits of collective action, exploration, and commercialization of resources from beyond Earth’s atmosphere while preventing a drawn-out international conflict to the final frontier. The will of states not to jeopardize the fundamental basis of international law must be reflected in coordination and surveillance efforts to ensure that the advantages derived from space exploration allow humanity to continue evolving.

**Three impacts–**

**First, goes nuclear**

**Gallagher 15** “Antisatellite warfare without nuclear risk: A mirage”<http://thebulletin.org/space-weapons-and-risk-nuclear-exchanges8346> (interim director of the Center for International and Security Studies in Maryland, previous Executive Director of the Clinton Administration’s CTBT Treaty Committee, an arms control specialist at the State Dept., and a faculty member at Wesleyan)//Elmer

In recent decades, however, as space-based reconnaissance, communication, and targeting capabilities have become integral elements of modern military operations, strategists and policy makers have explored whether carrying out antisatellite attacks could confer major military advantages without increasing the risk of nuclear war. In theory, the answer might be yes. In practice, it is almost certainly no. Hyping threats. No country has ever deliberately and destructively attacked a satellite belonging to another country (though nations have sometimes interfered with satellites' radio transmissions). But the United States, Russia, and China have all tested advanced kinetic antisatellite weapons, and the United States has demonstrated that it can modify a missile-defense interceptor for use in antisatellite mode. Any nation that can launch nuclear weapons on medium-range ballistic missiles has the latent capability to attack satellites in low Earth orbit. Because the United States depends heavily on space for its terrestrial military superiority, some US strategists have predicted that potential adversaries will try to neutralize US advantages by attacking satellites. They have also recommended that the US military do everything it can to protect its own space assets while maintaining a capability to disable or destroy satellites that adversaries use for intelligence, communication, navigation, or targeting. Analysis of this sort often exaggerates both potential adversaries’ ability to destroy US space assets and the military advantages that either side would gain from antisatellite attacks. Nonetheless, some observers are once again advancing worst-case scenarios to support arguments for offensive counterspace capabilities. In some other countries, interest in space warfare may be increasing because of these arguments. If any nation, for whatever reason, launched an attack on a second nation's satellites, nuclear retaliation against terrestrial targets would be an irrational response. But powerful countries do sometimes respond irrationally when attacked. Moreover, disproportionate retaliation following a deliberate antisatellite attack is not the only way in which antisatellite weapons could contribute to nuclear war. It is not even the likeliest way. As was clearly understood by the countries that negotiated the Outer Space Treaty, crisis management would become more difficult, and the risk of inadvertent deterrence failure would increase, if satellites used for reconnaissance and communication were disabled or destroyed. But even if the norm against attacking another country’s satellites is never broken, developing and testing antisatellite weapons still increase the risk of nuclear war. If, for instance, US military leaders became seriously concerned that China or Russia were preparing an antisatellite attack, pressure could build for a pre-emptive attack against Chinese or Russian strategic forces. Should a satellite be struck by a piece of space debris during a crisis or a low-level terrestrial conflict, leaders might mistakenly assume that a space war had begun and retaliate before they knew what had actually happened. Such scenarios may seem improbable, but they are no more implausible than the scenarios that are used to justify the development and use of antisatellite weapons.

**Extinction**

**Starr 15** [Steven, Senior Scientist for Physicians for Social Responsibility (www.psr.org) and Director of the Clinical Laboratory Science Program at the University of Missouri. Starr has published in the Bulletin of the Atomic Scientists and the Strategic Arms Reduction (STAR) website of the Moscow Institute of Physics and Technology] “Nuclear War: An Unrecognized Mass Extinction Event Waiting To Happen.” Ratical. March 2015. https://ratical.org/radiation/NuclearExtinction/StevenStarr022815.html TG

A war fought with 21st century strategic nuclear weapons would be more than just a great catastrophe in human history. If we allow it to happen, such a war would be a mass extinction event that ends human history. There is a profound difference between extinction and “an unprecedented disaster,” or even “the end of civilization,” because even after such an immense catastrophe, human life would go on. But extinction, by definition, is an event of utter finality, and a nuclear war that could cause human extinction should really be considered as the ultimate criminal act. It certainly would be the crime to end all crimes. The world’s leading climatologists now tell us that nuclear war threatens our continued existence as a species. Their studies predict that a large nuclear war, especially one fought with strategic nuclear weapons, would create a post-war environment in which for many years it would be too cold and dark to even grow food. Their findings make it clear that not only humans, but most large animals and many other forms of complex life would likely vanish forever in a nuclear darkness of our own making. The environmental consequences of nuclear war would attack the ecological support systems of life at every level. Radioactive fallout produced not only by nuclear bombs, but also by the destruction of nuclear power plants and their spent fuel pools, would poison the biosphere. Millions of tons of smoke would act to destroy Earth’s protective ozone layer and block most sunlight from reaching Earth’s surface, creating Ice Age weather conditions that would last for decades. Yet the political and military leaders who control nuclear weapons strictly avoid any direct public discussion of the consequences of nuclear war. They do so by arguing that nuclear weapons are not intended to be used, but only to deter. Remarkably, the leaders of the Nuclear Weapon States have chosen to ignore the authoritative, long-standing scientific research done by the climatologists, research that predicts virtually any nuclear war, fought with even a fraction of the operational and deployed nuclear arsenals, will leave the Earth essentially uninhabitable.

**Second, triggers massive debris cascades**

Edd **Gent 20,** freelance science and technology writer, “Space Mining Should Be a Global Project—But It's Not Starting Off That Way,” Singularity Hub, 10-12-2020, https://singularityhub.com/2020/10/12/the-us-is-trying-to-hijack-space-mining-and-there-could-be-disastrous-consequences/

Exploiting the resources of outer space might be key to the future expansion of the human species. But researchers argue that the US is trying to skew the game in its favor, with potentially disastrous consequences. The enormous cost of lifting material into space means that any serious effort to colonize the solar system will require us to rely on resources beyond our atmosphere. Water will be the new gold thanks to its crucial role in sustaining life, as well as the fact it can be split into hydrogen fuel and oxygen for breathing. Regolith found on the surface of rocky bodies like the moon and Mars will be a crucial building material, while some companies think it will eventually be profitable to extract precious metals and rare earth elements from asteroids and return them to Earth. But so far, there’s little in the way of regulation designed to govern how these activities should be managed. Now two Canadian researchers argue in a paper in Science that recent policy moves by the US are part of a concerted effort to refocus international space cooperation towards short-term commercial interests, which could precipitate a “race to the bottom” that sabotages efforts to safely manage the development of space. Aaron Boley and Michael Byers at the University of British Columbia trace back the start of this push to the 2015 Commercial Space Launch Competitiveness Act, which gave US citizens and companies the right to own and sell space resources under US law. In April this year, President Trump doubled down with an executive order affirming the right to commercial space mining and explicitly rejecting the idea that space is a “global commons,” flying in the face of established international norms. Since then, NASA has announced that any countries wishing to partner on its forthcoming Artemis missions designed to establish a permanent human presence on the moon will have to sign bilateral agreements known as Artemis Accords. These agreements will enshrine the idea that commercial space mining will be governed by national laws rather than international ones, the authors write, and that companies can declare “safety zones” around their operations to exclude others. Speaking to Space.com Mike Gold, the acting associate administrator for NASA’s Office of International and Interagency Relations, disputes the authors’ characterization of the accords and says they are based on the internationally-recognized Outer Space Treaty. He says they don’t include agreement on national regulation of mining or companies’ rights to establish safety zones, though they do assert the right to extract and use space resources. But given that they’ve yet to be released or even finalized, it’s not clear how far these rights extend or how they are enshrined in the agreements. And the authors point out that the fact that they are being negotiated bilaterally means the US will be able to use its dominant position to push its interpretation of international law and its overtly commercial goals for space development. Space policy designed around the exploitation of resources holds many dangers, say the paper authors. For a start, loosely-regulated space mining could result in the destruction of deposits that could hold invaluable scientific information. It could also kick up dangerous amounts of lunar dust that can cause serious damage to space vehicles, increase the amount of space debris, or in a worst-case scenario, create meteorites that could threaten satellites or even impact Earth. By eschewing a multilateral approach to setting space policy, the US also opens the door to a free-for-all where every country makes up its own rules. Russia is highly critical of the Artemis Accords process and China appears to be frozen out of it, suggesting that two major space powers will not be bound by the new rules. That potentially sets the scene for a race to the bottom, where countries compete to set the laxest rules for space mining to attract investment. The authors call on other nations to speak up and attempt to set rules through the UN Committee on the Peaceful Uses of Outer Space. Writing in The Conversation, Scott Shackelford from Indiana University suggests a good model could be the 1959 Antarctic Treaty, which froze territorial claims and reserved the continent for “peaceful purposes” and “scientific investigation.” But the momentum behind the US’ push might be difficult to overcome. Last month, the agency announced it would pay companies to excavate small amounts of regolith on the moon. Boley and Byers admit that if this went ahead and was not protested by other nations, it could set a precedent in international law that would be hard to overcome. For better or worse, it seems that US dominance in space exploration means it’s in the driver’s seat when it comes to setting the rules. As they say, to the victor go the spoils.

**Goes nuclear**

**Johnson 13** [Les Johnson, Deputy Manager for NASA's Advanced Concepts Office at the Marshall Space Flight Center, Co-Investigator for the JAXA T-Rex Space Tether Experiment and PI of NASA's ProSEDS Experiment, Master's Degree in Physics from Vanderbilt University, Popular Science Writer, and NASA Technologist, Frequent Contributor to the Journal of the British Interplanetary Sodety and Member of the American Institute of Aeronautics and Astronautics, National Space Society, the World Future Society, and MENSA, Sky Alert!: When Satellites Fail, p. 9-12]

Whatever the initial cause, the result may be the same. A satellite destroyed in orbit will break apart into thousands of pieces, each traveling at over 8 km/sec. This virtual shotgun blast, with pellets traveling 20 times faster than a bullet, will quickly spread out, with each pellet now following its own orbit around the Earth. With over 300,000 other pieces of junk already there, the tipping point is crossed and a runaway series of collisions begins. A few orbits later, two of the new debris pieces strike other satellites, causing them to explode into thousands more pieces of debris. The rate of collisions increases, now with more spacecraft being destroyed. Called the "Kessler Effect", after the NASA scientist who first warned of its dangers, these debris objects, now numbering in the millions, cascade around the Earth, destroying every satellite in low Earth orbit. Without an atmosphere to slow them down, thus allowing debris pieces to bum up, most debris (perhaps numbering in the millions) will remain in space for hundreds or thousands of years. Any new satellite will be threatened by destruction as soon as it enters space, effectively rendering many Earth orbits unusable. But what about us on the ground? How will this affect us? Imagine a world that suddenly loses all of its space technology. If you are like most people, then you would probably have a few fleeting thoughts about the Apollo-era missions to the Moon, perhaps a vision of the Space Shuttle launching astronauts into space for a visit to the International Space Station (ISS), or you might fondly recall the "wow" images taken by the orbiting Hubble Space Telescope. In short, you would know that things important to science would be lost, but you would likely not assume that their loss would have any impact on your daily life. Now imagine a world that suddenly loses network and cable television, accurate weather forecasts, Global Positioning System (GPS) navigation, some cellular phone networks, on-time delivery of food and medical supplies via truck and train to stores and hospitals in virtually every community in America, as well as science useful in monitoring such things as climate change and agricultural sustainability. Add to this the [destruction] ~~crippling~~ of the US military who now depend upon spy satellites, space-based communications systems, and GPS to know where their troops and supplies are located at all times and anywhere in the world. The result is a nightmarish world, one step away from nuclear war, economic disaster, and potential mass starvation. This is the world in which we are now perilously close to living. Space satellites now touch our lives in many ways. And, unfortunately, these satellites are extremely vulnerable to risks arising from a half-century of carelessness regarding protecting the space environment around the Earth as well as from potential adversaries such as China, North Korea, and Iran. No government policy has put us at risk. It has not been the result of a conspiracy. No, we are dependent upon them simply because they offer capabilities that are simply unavailable any other way. Individuals, corporations, and governments found ways to use the unique environment of space to provide services, make money, and better defend the country. In fact, only a few space visionaries and futurists could have foreseen where the advent of rocketry and space technology would take us a mere 50 years since those first satellites orbited the Earth. It was the slow progression of capability followed by dependence that puts us at risk. The exploration and use of space began in 1957 with the launch of Sputnik 1 by the Soviet Union. The United States soon followed with Explorer 1. Since then, the nations of the world have launched over 8,000 spacecraft. Of these, several hundred are still providing information and services to the global economy and the world's governments. Over time, nations, corporations, and individuals have grown accustomed to the services these spacecraft provide and many are dependent upon them. Commercial aviation, shipping, emergency services, vehicle fleet tracking, financial transactions, and agriculture are areas of the economy that are increasingly reliant on space. Telestar 1, launched into space in the year of my birth, 1962, relayed the world's first live transatlantic news feed and showed that space satellites can be used to relay television signals, telephone calls, and data. The modern telecommunications age was born. We've come a long way since Telstar; most television networks now distribute most, if not ali, of their programming via satellite. Cable television signals are received by local providers from satellite relays before being sent to our homes and businesses using cables. With 65% of US households relying on cable television and a growing percentage using satellite dishes to receive signals from direct-to-home satellite television providers, a large number of people would be cut off from vital information in an emergency should these satellites be destroyed. And communications satellites relay more than television signals. They serve as hosts to corporate video conferences and convey business, banking, and other commercial information to and from all areas of the planet. The first successful weather satellite was TIROS. Launched in 1960, TIROS operated for only 78 days but it served as the precursor for today's much more long-lived weather satellites, which provide continuous monitoring of weather conditions around the world. Without them, providing accurate weather forecasts for virtually any place on the globe more than a day in advance would be nearly impossible. Figure !.1 shows a satellite image of Hurricane Ivan approaching the Alabama Gulf coast in 2004. Without this type of information, evacuation warnings would have to be given more generally, resulting in needless evacuations and lost economic activity (from areas that avoid landfall) and potentially increasing loss of life in areas that may be unexpectedly hit. The formerly top-secret Corona spy satellites began operation in 1959 and provided critical information about the Soviet Union's military and industrial capabilities to a nervous West in a time of unprecedented paranoia and nuclear risk. With these satellites, US military planners were able to understand and assess the real military threat posed by the Soviet Union. They used information provided by spy satellites to help avert potential military confrontations on numerous occasions. Conversely, the Soviet Union's spy satellites were able to observe the United States and its allies, with similar results. It is nearly impossible to move an army and hide it from multiple eyes in the sky. Satellite information is critical to all aspects of US intelligence and military planning. Spy satellites are used to monitor compliance with international arms treaties and to assess the military activities of countries such as China, Russia, Iran, and North Korea. Figure 1.2 shows the capability of modem unclassified space-based imaging. The capability of the classified systems is presumed to be significantly better, providing much more detail. Losing these satellites would place global militaries on high alert and have them operating, literally, in the blind. Our military would suddenly become vulnerable in other areas as well. GPS, a network of 24-32 satellites in medium-Earth orbit, was developed to provide precise position information to the military, and it is now in common use by individuals and industry. The network, which became fully operational in 1993, allows our armed forces to know their exact locations anywhere in the world. It is used to guide bombs to their targets with unprecedented accuracy, requiring that only one bomb be used to destroy a target that would have previously required perhaps hundreds of bombs to destroy in the pre-GPS world (which, incidentally, has resulted in us reducing our stockpile of non-GPS-guided munitions dramatically). It allows soldiers to navigate in the dark or in adverse weather or sandstorms. Without GPS, our military advantage over potential adversaries would be dramatically reduced or eliminated.

**Sats solve every impact–warming, food wars, disease, etc**

Dylan **Taylor**, 5-11-**2020**, "Space technologies can help solve Earth's challenges (op-ed)," Space, <https://www.space.com/space-technologies-help-solve-earth-challenges.html> //SR

Many people may not recognize that the development of space exploration technologies has already helped benefit Earth in many ways, especially when it comes to communications, Earth observation and even fostering economic growth. Space technologies are surprisingly critical in impacting government, industry and personal daily decision-making. However, with more planetary-wide troubles such as climate change, humanitarian crises, mass migration and others on the horizon, how effectively can we rely on space technologies to sustain our own Earth and life on it? Combating climate change Climate change is altering environments across the globe, causing harsh superstorms and weather patterns that are an ever-increasing threat to the sustainability of life on Earth. However, space satellites can do much more than simply predict daily weather forecasts. Space systems can save thousands of lives from extreme weather each year. Before satellite technology, major disaster incidents like the 1900 Galveston, Texas, hurricane killed from 6,000 to 12,000 people because there were no early-warning systems allowing people to get out of harm's way. NASA's satellite data was the first to reveal a massive hole in the ozone layer over the South Pole. Just over a decade ago, we weren't yet using weather apps or online mapping applications to get to where we're going in efficient ways. Earth-observation satellites monitor greenhouse gases and other climate indicators, while also allowing us to analyze Earth's ecosystem health more effectively. For example, technologies adapted from space use, like GPS and semiconductor solar cells, have dramatically reduced greenhouse gas emissions. GPS navigation reduces fuel use on sea, land and in the air by up to 15 to 21 percent, which is more than what more efficient engines or fuel changes have offered. Solar photovoltaic power, which was first used by NASA on projects like the International Space Station, has led to massive improvements in solar energy performance. In the future, orbital space power stations could continuously send down clean power day or night through targeted radiation, whatever weather conditions on Earth may be. Free from atmospheric events, solar power would be more efficient than current solar technology. Additionally, sending solar power generation to space would free up land and cultural resources from huge panel arrays, and it would also save landfills from discarded solar panel waste. Climate change's impact is also harming agriculture production, fisheries management, freshwater sources and forestry. Earth-observation satellites, however, allow us to track, monitor and identify environmentally harmful activities like illegal logging, animal poaching, fires and mining. The closer we monitor these incidents, the better we can offer early and immediate action to help stop these events. Without these systems in place, we would have no way to assess and deal with climate change in a scientific capacity. Confronting humanitarian crises Not only can using space observations help protect society from climate change, but it can also improve society in the commercial, public health and national safety sectors. World hunger, for instance, is one of the leading humanitarian crises in the world. But satellite imagery can identify crop yield through a magnified view of each pixel, allowing farmers to understand when to water, fertilize and harvest crops. Imaging the land using special spectral bands like near infrared, we can create a vegetation index that represents crop yield productivity. And satellites are uniquely able to capture and collect data on agricultural areas, which make up 37 percent of Earth's landmass. What's more, big data applications of space technology are instrumental to developing nations, which are especially susceptible to natural disasters due to their limited resources. The United Nations Office for Outer Space Affairs (UNOOSA) even has a platform for space-based information for disaster management and emergency response (UN-SPIDER), which uses big data and satellite technology to respond to natural disasters in African countries. With an increasing amount of data from Earth-observation tech, social media, crowdsourced geolocation, virtual tools and internet access, big data can help generate insights that allow us to make better decisions in emergencies while sticking to sustainability goals. The future benefits of space activities In the next 5 to 20 years, we will see a huge transformation in more advanced space technologies. It's expected that satellite megaconstellations, fast point-to-point suborbital transport (which will save on fuel emissions) and asteroid impact prevention (although the technology is still in its infancy) will all make their mark. Megaconstellations are emerging with great promise. These satellite groups can enhance efficiency, capacity and safety to a variety of Earth-based services and business users in the maritime, energy, banking, government and telecommunications sectors. By using big data, megaconstellations will create more latent, higher-speed internet with increased throughput and global coverage that will benefit billions of everyday internet users. Currently, SpaceX, Amazon, Telesat and Samsung all aim to loft huge satellite networks. Space technologies are an integral part of our evolution as a society. As we further explore the cosmos, the level of innovation and exploration needed to do so will help inform how we may purposefully integrate and adapt these tools to benefit our lives down on the surface. While we still have a long journey to evolve these technologies, the track record is there that we can use them to enhance our society and ultimately safeguard our planet, too.

**Third, destroys the ozone**

**Marais 21** Eloise Marais 7-19-2021 "Space tourism: rockets emit 100 times more CO₂ per passenger than flights – imagine a whole industry"<https://theconversation.com/space-tourism-rockets-emit-100-times-more-co-per-passenger-than-flights-imagine-a-whole-industry-164601> (Associate Professor in Physical Geography, UCL)//Elmer

The commercial race to get tourists to space is heating up between Virgin Group founder Sir Richard Branson and former Amazon CEO Jeff Bezos. On Sunday 11 July, Branson ascended 80 km to reach the edge of space in his piloted Virgin Galactic VSS Unity spaceplane. Bezos’ autonomous Blue Origin rocket is due to launch on July 20, coinciding with the anniversary of the Apollo 11 Moon landing. Though Bezos loses to Branson in time, he is set to reach higher altitudes (about 120 km). The launch will demonstrate his offering to very wealthy tourists: the opportunity to truly reach outer space. Both tour packages will provide passengers with a brief ten-minute frolic in zero gravity and glimpses of Earth from space. Not to be outdone, Elon Musk’s SpaceX will provide four to five days of orbital travel with its Crew Dragon capsule later in 2021. What are the environmental consequences of a space tourism industry likely to be? Bezos boasts his Blue Origin rockets are greener than Branson’s VSS Unity. The Blue Engine 3 (BE-3) will launch Bezos, his brother and two guests into space using liquid hydrogen and liquid oxygen propellants. VSS Unity used a hybrid propellant comprised of a solid carbon-based fuel, hydroxyl-terminated polybutadiene (HTPB), and a liquid oxidant, nitrous oxide (laughing gas). The SpaceX Falcon series of reusable rockets will propel the Crew Dragon into orbit using liquid kerosene and liquid oxygen. Burning these propellants provides the energy needed to launch rockets into space while also generating greenhouse gases and air pollutants. Large quantities of water vapour are produced by burning the BE-3 propellant, while combustion of both the VSS Unity and Falcon fuels produces CO₂, soot and some water vapour. The nitrogen-based oxidant used by VSS Unity also generates nitrogen oxides, compounds that contribute to air pollution closer to Earth. Roughly two-thirds of the propellant exhaust is released into the stratosphere (12 km-50 km) and mesosphere (50 km-85 km), where it can persist for at least two to three years. The very high temperatures during launch and re-entry (when the protective heat shields of the returning crafts burn up) also convert stable nitrogen in the air into reactive nitrogen oxides. These gases and particles have many negative effects on the atmosphere. In the stratosphere, nitrogen oxides and chemicals formed from the breakdown of water vapour convert ozone into oxygen, depleting the ozone layer which guards life on Earth against harmful UV radiation. Water vapour also produces stratospheric clouds that provide a surface for this reaction to occur at a faster pace than it otherwise would. Space tourism and climate change Exhaust emissions of CO₂ and soot trap heat in the atmosphere, contributing to global warming. Cooling of the atmosphere can also occur, as clouds formed from the emitted water vapour reflect incoming sunlight back to space. A depleted ozone layer would also absorb less incoming sunlight, and so heat the stratosphere less. Figuring out the overall effect of rocket launches on the atmosphere will require detailed modelling, in order to account for these complex processes and the persistence of these pollutants in the upper atmosphere. Equally important is a clear understanding of how the space tourism industry will develop. Virgin Galactic anticipates it will offer 400 spaceflights each year to the privileged few who can afford them. Blue Origin and SpaceX have yet to announce their plans. But globally, rocket launches wouldn’t need to increase by much from the current 100 or so performed each year to induce harmful effects that are competitive with other sources, like ozone-depleting chlorofluorocarbons (CFCs), and CO₂ from aircraft. During launch, rockets can emit between four and ten times more nitrogen oxides than Drax, the largest thermal power plant in the UK, over the same period. CO₂ emissions for the four or so tourists on a space flight will be between 50 and 100 times more than the one to three tonnes per passenger on a long-haul flight. In order for international regulators to keep up with this nascent industry and control its pollution properly, scientists need a better understanding of the effect these billionaire astronauts will have on our planet’s atmosphere.

**Extinction**

**Martin 18** (a Science Reporter for Express.co.uk, Sean, “Ozone layer DECAYING as scientists fear Earth 'heading towards MASS-EXTINCTION'”, via Express, Feb 8,<https://www.express.co.uk/news/science/916405/ozone-layer-destroyed-recovering-mass-extinction-dinosaurs>)

News in January broke that the ozone was on its way to recovering as Earth cuts down on CO2 emissions. However, on closer inspection, scientists now say the ozone layer – the part of the atmosphere which protects us from harmful radiation – is continuing to deplete over major cities, and is only really recovering over Antarctica. Chemicals known as CFCs, which are found in aerosols for example, have been destroying the ozone layer since the 1970s. The Montreal Protocol was agreed in 1987 to phase out CFCs, but researchers say it may be too late.Study co-author Professor Joanna Haigh, co-director of the Grantham Institute for Climate Change and the Environment at Imperial College London, said of the study published in Atmospheric Chemistry and Physics: "Ozone has been seriously declining globally since the 1980s, but while the banning of CFCs is leading to a recovery at the poles, the same does not appear to be true for the lower latitudes. "The potential for harm in lower latitudes may actually be worse than at the poles. “The decreases in ozone are less than we saw at the poles before the Montreal Protocol was enacted, but UV radiation is more intense in these regions and more people live there.” In a separate study, researchers have found a thinning ozone layer could have led to a mass extinction 252 million years ago – meaning a depletion of the protective layer of the atmosphere could be more catastrophic than previously thought. During the Permian-Triassic extinction, 75 percent of land animals and 95 percent of marine life died. At the same time, there was a massive volcanic event occurring in a region known as the Siberian Traps. Scientists state the huge eruption, which lasted for a staggering one million years, virtually destroyed the ozone layer which allowed more UV radiation to pierce Earth. Graduate student Jeffrey Benca of the University of California, Berkeley, said of his research published in Science Advances: "During the end-Permian crisis, the forests may have disappeared in part or fully because of increased UV exposure. “With pulses of volcanic eruptions happening, we would expect pulsed ozone shield weakening, which may have led to forest declines previously observed in the fossil record. "If you disrupt some of the dominant plant lineages globally repeatedly, you could trigger trophic cascades by destabilising the food web base, which doesn't work out very well for land animals." As the ozone layer continues to be destroyed in modern times, scientists warn another catastrophic mass extinction could be on the cards. Co-author Cindy Looy of the Science Advances study said: "Palaeontologists have come up with various kill scenarios for mass extinctions, but plant life may not be affected by dying suddenly as much as through interrupting one part of the life cycle, such as reproduction, over a long period of time, causing the population to dwindle and potentially disappear.”

## Underview

**[1] 1AR Theory:**

**[a] AFF gets it to check infinite neg abuse**

**[b] Drop the debater – the short 1AR irreparably skewed from abuse on substance and time investment on theory.**

**[c] No RVI – 6 minute 2n can just dump on a 20 second 1ar shell and win on sheer brute force**

**[d] Competing Interps--6 minutes on a 20 second shell is more than enough to justify their interp**

**[e] Fairness and education are voters – debate’s a game that needs rules to evaluate it and it teaches portable skills that we use lifelong**

**[f] No 1NC contestation of paradigm issues because I would need to win 2 things, which is irreciprocal**

**[g] No 2NR “I meets” -- skews theory ground because they’re each a NIB for me to winning theory which kills my ability to check abuse**

**[g] No rvi for preemptive violations–they’d spent 7 minutes on a 10 second shell and the round ends right there–the entire aff can’t be the shell cuz they’d choose not to violate**

**[2] If I win one layer vote aff**

**[a] Time skew--neg has 7 minutes to uplayer and makes the round impossible to win**

**[b] It forces you to engage with the aff creating substantive discussion on something we both had time to prep for**

**[3] The neg may only make one response to each argument in the aff and must answer them all**

**[a] Makes sure we have an equal number of arguments for reciprocity**

**[b] Solves flooding the 1ar since you choose the best answers**

**[4] The neg must extend all arguments twice in either the 1nc or 2nr – aff has to waste time extending twice in the 1ar and 2ar so its reciprocal**

**[5] Neg interps are counterinterps since the AC takes a stance and came lexically prior - means you re-evaluate the AC under their interp and evaluate the debate after the 1ar so both of us get one rebuttal**

**[6] No neg analytics – I don’t have time to cover 100 blippy arguments in the NC since you can read 7 min of analytics and extend any of them to win.**

**[7] Reject neg overview responses--they can read 7 minutes of an overview that the 4 minute 1ar can’t make strategic choices to concede certain parts and trades off with in depth specific line by line which is bad for clash**

**[8] Neg may not take prep time--they already have 30 minutes of pre round prep which should compensate--no prep is key to reciprocity**

**[9] Reject neg metatheory–they have 2 speeches for non preemptive violations but I only have the 1ar, means 1nc uplayering ensures we can never set the 1ar’s norms**