# 1AC

#### Judge, let me crystalize and boil down this debate for you to vote affirmative right now for a couple main reasons.

#### First, the affirmative simply outweighs the negative. Our impacts lead to extinction level catastrophic events that kill all life on earth like the space war or nuclear war scenarios. The biggest impact of the negative is climate change – while we solve for climate change by maintaining environmental satellites and nuclear war and space war etc.

#### Second, the affirmative doesn’t actually link into their scenarios – no where in the aff world do we say that we ban all satellites, we only restrict private appropriation to the events that are potentially dangerous

#### Third, Plummer in the framework indicates that extinction is the greatest impact that matters in the debate. Even if you grant them to be winning arguments

## Framework

**I value morality. My standard is maximizing expected well-being. There are 3 reasons to prefer my framework**

**1. Reducing existential risks should be the top priority in any coherent moral theory. This means preventing extinction outweighs, even if I lose my other framework arguments**

**Pummer, PhD, 15**

(Theron, Philosophy @St. Andrews http://blog.practicalethics.ox.ac.uk/2015/05/moral-agreement-on-saving-the-world/)

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.** W**hat 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. Governments must use utilitarianism due to uncertainty. Because governments cannot know how their actions will affect every single individual, they must take actions that are good for the population on average. This necessitates utilitarian tradeoffs.**

**Gooden, 1995 (**Robert, philsopher at the Research School of the Social Sciences, Utilitarianism as Public Philosophy. P. 62-63)

Consider, first, the argument from necessity. Public officials are obliged to make their choices under uncertainty, and uncertainty of a very special sort at that. All choices—public and private alike—are made under some degree of uncertainty, of course. But in the nature of things, private individuals will usually have more complete information on the peculiarities of their own circumstances and on the ramifications that alternative possible choices might have on them. Public officials, in contrast, are relatively poorly informed as to the effects that their choices will have on individuals, one by one. What they typically do know are generalities: averages and aggregates. They know what will happen most often to most people as a result of their various possible choices. But that is all. That is enough to allow public policy-makers to use the utilitarian calculus—if they want to use it at all—to choose general rules of conduct. Knowing aggregates and averages, they can proceed to calculate the utility payoffs from adopting each alternative possible general rules.

#### We will provide more justifications if our frameowkr is contested

#### I affirm: The appropriation of outer space by private entities is unjust.

#### Private entities are increasing mining now and the US is key

Robert **Garcia 18**, currently an LLM Candidate in Cornell Law School's Law, Entrepreneurship & Technology program at Cornell Tech in NYC., “Regulating International Space Mining, an Enormous Industry,” Pacific Council on International Policy, 10-23-2018, https://www.pacificcouncil.org/newsroom/regulating-international-space-mining-enormous-industry

In 2015, the United States passed the U.S. Commercial Space Launch Competitiveness Act. The law’s passage has caused some consternation in the international space exploration community, as it specifically contemplates U.S. citizens performing commercial recovery in what would be a clear appropriation of asteroid and space resources. The law in pertinent part states that such U.S. citizens: shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States (emphasis added). Luxembourg was quick to follow suit, and it passed its own national space mining law styled the Law of 20 July 2017 on the Exploration and Use of Space Resources. This law seeks to parallel U.S. law. However, according to a spokesman for the Luxembourg Ministry of Economy, there is one significant expansion over U.S. law, in that "in the U.S. law, a majority of a company's stakeholders must be in the United States, while the Luxembourg law places no restrictions on stakeholder locations." Critics state that the controlling international law is to be found in the United Nations treaties on space exploration. There are five major space treaties, but two specifically address exploitation of outer space resources. The first is the "Outer Space Treaty" (OST). One hundred nations, including the major spacefaring nations-the United States, China, Japan, and the Russian Federation-have ratified it. A subsequent treaty-the Moon Agreement-provides in a relevant part in Article 11, Paragraph 2, that "[t]he moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means." As of January 2018, relatively few states (18 total) had ratified the Moon Agreement and four additional states had signed but not ratified the agreement. However, of these 22 states, perhaps only Australia, France, and India have the capability to launch space vehicles. The Moon Agreement could have provided some guidance on exploitation of space resources, as it ostensibly prohibits claiming lunar natural resources for private ownership. However, the United States and Luxembourg are not parties to the Moon Agreement, and in consequence the treaty has no "governing effect." Nonetheless, some legal scholars contend that the United States would be in breach of its international obligations if it were to "unilaterally pretend" that its citizens may exercise ownership over extracted space resources, given the absence of recognition of such rights under international law. Clearly it is the stated aim of both the United States and Luxembourg to promote the commercial exploitation of space resources. The two nations’ respective pieces of legislation attempt to provide a legal basis for private citizens to engage in such activities, **which some critics would characterize as prohibited "appropriation" under international law. The international community would be well-served by resolving the issue conclusively with an appropriate body of rules**. As the technologies advance, we are inexorably headed toward space mining becoming a reality. Whether it will lead to increased resources, providing a net benefit for all people on earth, or serve to increase economic inequality by disproportionately favoring the spacefaring nations remains to be seen.

#### The increase in private mining is dangerous and unregulated.

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 rule**s. 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.

#### Dangerous mining greatly increases the risk of space debris.

Sarah **Scoles 15**, “Dust from asteroid mining spells danger for satellites,” New Scientist, 5-27-2015, https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/

NASA chose the second option for its Asteroid Redirect Mission, which aims to pluck a boulder from an asteroid’s surface and relocate it to a stable orbit around the moon. But an asteroid’s gravity is so weak that it’s not hard for surface particles to escape into space. **Now a new model warns that debris shed by such transplanted rocks could intrude where many defence and communication satellites live** – in geosynchronous orbit. According to Casey Handmer of the California Institute of Technology in Pasadena and Javier Roa of the Technical University of Madrid in Spain, 5 per cent of the escaped debris will end up in regions traversed by satellites. Over 10 years, it would cross geosynchronous orbit 63 times on average. **A satellite in the wrong spot at the wrong time will suffer a damaging high-speed collision with that dust.** The study also looks at the “catastrophic disruption” of an asteroid 5 metres across or bigger. Its total break-up into a pile of rubble would increase the risk to satellites by more than 30 per cent (arxiv.org/abs/1505.03800). That may not have immediate consequences. But as Earth orbits get more crowded with spent rocket stages and satellites, we will have to worry about cascades of collisions like the one depicted in the movie Gravity. Handmer and Roa want to point out the problem now so that we can find a solution before any satellites get dinged. **“It is possible to quantify and manage the risk**,” says Handmer. “**A few basic precautions will prevent harm due to stray asteroid material.”**

#### Clustering makes the risk of collisions *uniquely high* and the risk is understated

Dr. Darren **McKnight 17**, Ph.D., Technical Director for Integrity Applications, Previously Senior Vice President and Director of Science and Technology Strategy at Science Applications International Corporation, “Proposed Series of Orbital Debris Remediation Activities,” 3rd International Conference and Exhibition on Satellite & Space Missions, 5/13/2017, https://iaaweb.org/iaa/Scientific%20Activity/debrisminutes03166.pdf [graphics omitted]

In the future, this population will be added to **primarily** from collisions between large objects in orbit as the number of LNT produced is **proportional to** the **mass** involved in a collision (or explosion).2 Cataloged debris produced from a catastrophic collision will be liberated at about 1-3 fragments per kilogram of mass involved while LNT production is around 10-40 fragments per kilogram of mass involved. The Iridium/Cosmos collision involved a total mass of 2,000kg and produced over 3,000 trackable fragments and likely 10,000-15,0003 LNT debris. The Feng-Yun purposeful collision yielded over 2,200 trackable fragments and likely over 30,000 LNT from only ~850kg of mass involved. While it is important to prevent these types of events from occurring in the future, the consequence of a collision (based on number of LNT produced) will be proportional to the mass involved in the collision. The term “mass involved” implies a good coupling of the impactor mass with the target mass. For a large fragment (e.g., several kilograms) striking a typical payload (that is densely built) in its main satellite body (vice striking a solar array or other appendage) at hypervelocity speeds (i.e., above 6km/s) will result in all the mass being “involved” in the debris. However, a large fragment striking a derelict rocket body, due to the way that the mass is concentrated at the ends of a rocket body, will likely not result in all of the mass being “involved” in the liberated debris. However, it is likely that when two **large derelicts**, either rocket bodies or payloads, collide with each other, then **all of the mass** will be involved due to the likely direct physical interaction between the mass. The table below summarizes the mass involvement scenarios which highlight why the massive-on-massive collisions are the focus of our analyses. Therefore, it is best to prevent the collision of the most massive objects with each other (higher consequence) and the ones that are the most likely (higher probability) since risk is probability multiplied by consequence. Our ability to model and predict the **rate of collisions** is based empirically up**on** only **one** catastrophic accidental collision **event** and a model developed on the kinetic theory of gases (**KTG**). However, clusters **of massive objects** that have identical inclinations plus similar and overlapping apogees/perigees may indeed have a greater probability of collision **than predicted** by the KTG-based algorithms as **they are not randomly distributed** and their **orbit**al element evolution (e.g., change in right ascension of ascending node and argument of perigee) is also **similar**. It is hypothesized that these similarities could result in resonances of collision dynamics that may lead to **larger probability of collision values than predicted with current algorithms**. The not well-known fact is that many of **the most massive** objects are in **tightly clumped** clusters that will likely produce **greater probability** of collision than estimated by the KTG approach (see attached paper) and with the much larger consequence (i.e., creation of catalogued LNT fragments). The attached paper that studied this possibility shows some initial indications that this may indeed be true but much more analysis is needed to provide this conclusively. This table of clusters **represent**s **well over** 50% of the total derelict mass in LEO. However, no one is currently **monitoring** these potential events. It is proposed that it would be a prudent risk management approach for space flight safety to monitor and characterize this inter-cluster collision risk. The Massive Collision Monitoring Activity (MCMA) is proposed whereby the encounters between members of these clusters are constantly monitored and close encounter information collected, plotted, analyzed, and shared. This would provide a rich research base for scientists and a predictive service for spacefaring countries. I am currently executing a subset of this proposed activity in an ad hoc fashion in conjunction with JSpOC. I have been monitoring the interaction dynamics between the SL-16 population in the 820- 865km altitude region for the last nine months.

#### This causes 4 impacts:

#### Debris cascades cause global nuke war through undermining military intelligence capabilities like GPS that are key to military stability.

Les **Johnson 13**, 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 [language modified]

Whatever the initial cause, the result may be the same. A **sat**ellite 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 **begin**s. 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, **destroy**ing every **sat**ellite in **l**ow **E**arth **o**rbit. 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 up**on** 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 **ag**riculture 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 **sat**ellite**s** 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 **info**rmation 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**.

#### Satellites are key to environmental monitoring – debris collapses it and causes climate extinction

Ben **Biggs 18**, PhD Researcher in Computer Vision and Deep Learning at the University of Cambridge, “How Satellites Can Protect Planet Earth From Disaster”, HowItWorks Daily, 12/22/2018, https://www.howitworksdaily.com/how-satellites-can-protect-planet-earth-from-disaster/

It might not look it, but our planet is a **fragile** place. A **delicate balance** of pressure, temperature and gases **keeps us alive**, as our atmosphere lets in enough heat for us to thrive – but not too much that we get too toasty. For many years our planet has looked after itself with ease. Now, with humans on the scene, things are changing more than ever, from **climate change** to **mass deforestation**. If **our planet is going to survive** long into the future it’s going to need our help. Fortunately, we’ve got plenty of missions that are working for the benefit of our world already. Using observation **sat**ellite**s** in orbit, scientists have been monitoring Earth for decades, watching how the planet pulsates and changes over time. From orbit we can **watch** how species migrate, **identify** and **predict** environmental changes and even **fix** problems. A great example of this was the global effort to **repair a hole in the ozone** above the Antarctic back in 1987. Two years prior, scientists had discovered that chemicals known as chlorofluorocarbons (CFCs) – produced by fridges and aerosols, among other things – were causing the hole to grow. As a result countries around the world agreed to phase out the use of CFC as part of the Montreal Protocol. In early 2018, NASA announced that its Aura satellite had watched the hole successfully close, with it expected to fully repair as early as 2060. It was proof that we could work together to change the planet for the better. Aura is part of a broader NASA project called the Earth Observing System (EOS). This programme, which began in 1997, has seen NASA launch missions and instruments into orbit. This has included the groundbreaking Landsat series of satellites, which have provided surface images of the whole globe. Then there’s the Terra mission that launched in 2009 and studies clouds, sea ice and more from orbit. Most of these satellites are in polar orbits, which means they orbit the planet from top to bottom so that it rotates underneath and gives them a global view. Planning for the EOS began back in the 1980s, with NASA keen to regularly fly instruments for at least 15 years. “Human activity has altered the condition of the Earth by reconfiguring the landscape, by changing the composition of the global atmosphere, and by stressing the biosphere in countless ways,” they noted in a handbook in 1993. “There are strong indications that natural change is being accelerated by human intervention.” More than two dozen missions have been launched as part of the EOS to date. Among the programme’s many accomplishments, scientists watched as an ice shelf collapsed on the Antarctic Peninsula in 2002 using the Terra satellite. The same satellite, along with the Aqua satellite launched in 2002, has provided a global view of how the vegetation cycle changes over the course of a year and the effect the climate has on it. Those same two satellites have also allowed us to see how summer sea ice in the Arctic is decreasing, which means that more of the Sun’s light is being absorbed rather than being reflected, raising global temperatures. The EOS has helped in other ways too, such as enabling scientists to keep a close eye on the levels of toxic gases like carbon monoxide being emitted from massive fires in the atmosphere. This allows people on the ground to be alerted to these dangers, and they can in turn be advised to limit their outdoor activity to protect their health. The EOS is even helping to track and monitor rare animals, such as chameleons in Madagascar. Here, scientists have been able to use satellite imagery, combined with known habitats of the animals, to map out where they are likely to be living. It would take survey teams on the ground thousands of years to replicate this information without satellites. It’s not just NASA that has been keeping a close eye on the planet. The European Space Agency (ESA) runs the Copernicus project, billed as the world’s largest single Earth observation campaign. Previously known as the Global Monitoring for Environment and Security (GMES) programme, it began with the launch of the Sentinel-1A satellite in April 2014. This radar imaging satellite provides images both day and night and during all weather conditions, and these are being used to map sea ice, track oil spills and more. This has been followed by half a dozen more missions, with the latest – Sentinel-3B – launching on 25 April 2018. This mission is focusing on monitoring the behaviour and health of the oceans, but it has a wide range of abilities. It flies in formation with its predecessor, Sentinel-3A, and together the two of them can provide global data for Earth across an entire day. The **sat**ellite**s** can measure the **temperature** over oceans, as well as the colour and height of the sea. They can also monitor wild**fires** from space, check the health of vegetation and map the way that land is being used around the world. And there are more Sentinel satellites on the way. In the coming years we’ll see the Sentinel-4 and Sentinel-5 missions launch, studying the composition of our planet’s atmosphere, while Sentinel-6 will measure global sea surface height for ocean and climate studies. “Copernicus will help shape the future of our planet for the benefit of all,” said the ESA, also noting that it isthe “most ambitious Earth observation programme to date,” one that will provide accurate and timely data on the environment, climate change and more. All of this data is **vital** for **directing climate policy** and **other human activities** on Earth. By observing our planet around the clock from space we can see the direct effect that humans are having on it. These are not the only climate-monitoring missions run by NASA and the ESA. The former has a number of other missions, including the Deep Space Climate Observatory, which observes the sunlit side of Earth. The latter has eight missions on the books in its Earth Explorer programme, including a mission to study how Earth’s gravity field varies over the surface of the planet, called the Gravity field and steady-state Ocean Circulation Explorer (GOCE), which ended in 2013. In 2016, countries of the world came together to sign the **Paris** Climate Agreement, a global effort to reduce carbon emissions to prevent the global average temperature rising by two degrees Celsius above pre-industrial levels. While the US later infamously reneged from this agreement, it was proof that with enough level-headed minds, minds that can see the **data** from missions showing how the planet is changing, we **can take action**. Humans continue to have a major effect on the planet, for better or worse, and monitoring that change is **vital to our planet’s survival**.

#### Independently, unregulated mining causes space war

Fengna **Xu 20**, Law School, Xi’an Jiaotong University, “The approach to sustainable space mining: issues, challenges, and solutions,” Fengna Xu 2020 IOP Conf. Ser.: Mater. Sci. Eng. 738 012014

Conflicts between multiple States Space resources, as res communis [3], can be appropriated to some extent on the basis of freedom of exploration and use of the outer space. However, it is likely to follow a ‘first come, first served’ approach to space resources activities. In fact, the ‘first come, first served’ approach drove early and rapid development of oil industry of the US in the 19th century, although a frenetic race among surface owners followed and led to an extraordinary waste of oil and gas. Given that so far there are no agreement or property rights on space resources, they are essentially in a ‘state of nature’. Allocation by the ‘first come, first served’ approach is simple and requires very little government involvement to deter another one (called a ‘junior’) from displacing the rightful first comer (called a ‘senior’). However, overprotecting the senior by priority rights could run the risk of disorder, waste, inequality, and even monopoly. The Outer Space Treaty, requires State parties to conduct all their activities in outer space ‘with due regard to the corresponding interests of all other States Parties’. Without specific coordinating rules, conflicts between multiple States are likely to happen. Private entities may choose to arm themselves to safeguard their own interests. In extreme cases, **States may also protect them by placing weapons of mass destruction in outer space if necessary [4]. As a result, priority rights should not be absolute but subjected to some arrangements. 7**

#### Resource shortages also cause war

Frosty Woolridge 9, Former Officer at the US Army Medical Service Corps, “America Galloping Toward Its Greatest Crisis in the 21st Century”, The Examiner, 5-22, http://www.examiner.com/examiner/x-3515-Denver-Political-Issues-Examiner~y2009m5d22-America-galloping-toward-its-greatest-crisis-in-the-21st-century

“It is clear that most politicians and most citizens do not recognize that returning to “more of the same” is a recipe for promoting the first collapse of a global civilization. The required changes in energy technology, which would benefit not only the environment but also national security, public health, and the economy, would demand a World War II type mobilization -- and even that might not prevent a global climate disaster. Without transitioning away from use of fossil fuels, humanity will move further into an era of resource wars (remember, Africom has been added to the Pentagon’s structure -- and China has noticed), clearly with intent to protect US “interests” in petroleum reserves. The consequences of more resource wars, many likely triggered over water supplies stressed by climate disruption, are likely to include increased unrest in poor nations, a proliferation of weapons of mass destruction, widening inequity within and between nations, and in the worst (and not unlikely) case, a nuclear war ending civilization.

#### Plan: to restrict private space appropriation

#### Creating a legal regime so everyone benefits from mining creates sustainable mining while avoiding conflict.

Morgan Saletta 16, PhD, History and Philosophy of Science, The University of Melbourne, “All of humanity should share in the space mining boom,” Conversation, 4-17-2016, https://theconversation.com/all-of-humanity-should-share-in-the-space-mining-boom-57740

One solitary asteroid might be worth trillions of dollars in platinum and other metals. Exploiting these resources could lead to a global boom in wealth, which could raise living standards worldwide and potentially benefit all of humanity. There are already companies, such as Planetary Resources, hoping to make mining in space a reality. Peter Diamondis, co-founder of Planetary Resources and founder of the XPrize Grand Challenges, believes that the benefits to humanity give us a moral imperative to explore and utilise space. He has also declared “there are twenty-trillion-dollar checks up there, waiting to be cashed!” However, behind the utopian rhetoric and dazzling dreams of riches lie some very real problems. Ownership and the Outer Space Treaty The framework of international space law is given by the Outer Space Treaty (OST), which entered into force in 1967. Among its main principals, the OST includes these statements: the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind and, outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means Because the OST is generally interpreted as preventing anything like private fee-simple ownership, it is sometimes claimed to be an obstacle to commercial ventures in space. But such claims simply do not hold water. There are numerous terrestrial examples where resources are profitably exploited in the absence of fee-simple ownership. Governments routinely licence companies to engage in timber extraction, mining, offshore oil exploration and other activities, receiving royalties payments on production. In the United States, revenues from such royalties totalled some US$13.5 billion dollars in 2014 from federally owned or managed lands alone. Nevertheless, some proponents of mining in outer space argue for serious modification or an end to the Outer Space Treaty and claim, against the evidence, that without fee-simple ownership, there is no incentive for commercial exploitation. The Unites States’ Space Act of 2015 was just one volley – and a deliberately vague one at that – in this ongoing international debate. A balanced approach? The riches exist, but how will humanity benefit from mining in outer space, or for that matter, other global commons such as the deep sea floor? Behind the lofty rhetoric of benefits to humanity, there is a dark shadow of voodoo economics, the shambling, walking dead figure of trickle down economics– and the possibility of a world where a few trillionaires enjoy the view from space while others barely eke a living on its surface. Yet we do suggest that commercial interests and profit seeking can be a healthy part of the exploration of outer space. Yet outer space is not the Wild West frontier of Frederick Jackson Turner, nor do we live in the Gold Rush days of Jack London’s tale of greed and death. In the common heritage of space, with multiple state and private actors engaging in exploration and potentially exploitation, international cooperation and oversight will benefit all. The Alaskan model There is a balanced, pragmatic approach that will promote commercial and profit driven activities, while also producing tangible benefits to all of humanity. Importantly, this pragmatic approach has a well established precedent that has existed for nearly 40 years. And this comes not from a social democracy or left-wing ideology, but was the brainchild of a libertarian, Republican governor of Alaska, Jay Hammond. That model is the Alaska Permanent Fund Corporation (APFC) created in 1976, and its unique “citizen’s dividend”. The APF is a resource wealth fund, which derives its revenue primarily from leases on oil fields. In 1977, Hammond suggested that “rather than permitting government to spend all public monies earned through the exploitation of the public’s resources for what government thinks best, let’s grant shares to Alaskans.” The first dividend payment was made in 1982, and in 2015 that payment amounted to US$2,072. Linking a citizen’s dividend to a sovereign wealth fund was unique, but the idea of a citizen’s dividend has a long and venerable tradition. One of the earliest advocates was no less than the political theorist and American Revolutionary, Thomas Paine. International body How would this work for outer space? We need an international body similar to the International Seabed Authority, which was established by the United Nations Convention on the Law of the Sea, or the International Telecommunications Union, which allocates satellite orbits. This would provide the stable business and investment environment that entrepreneurs seek by ensuring international law and obligations are met. This body could license outer space resources and levy a royalty on production, which is part of standard business practice between petroleum and other mining companies and governments here on Earth. In turn, these revenues, or a significant portion thereof, would be deposited in a Space Resource Fund, possibly under the aegis of the World Bank. And every single citizen on Earth, say aged 18 or above, would receive a dividend on a yearly basis as their rightful share as owners of the common province of humankind. Crucially, we are not suggesting redistribution, which has been an obstacle to the International Seabed Authority and the Moon Treaty in the past, but a fair share dividend of wealth that truly belongs to everyone. Our model doesn’t provide a handout, or a welfare cheque, or charity from a trillionaire philanthopist; it pays every owner in a global commons a share of what is rightfully theirs. Even tiny dividends by the standards of the world’s wealthy nations would make a difference for some developing world farmers. If there truly are trillions of dollars out there, then this might be something fundamentally world changing. We accept that Larry Page and Sir Richard Branson – founding investors and advisors in Planetary Resources – and its founders Eric Anderson and Peter Diamandis, truly want humanity to benefit from outer space, and that they truly believe in corporate social responsibility and a sustainable future. We would encourage them to embrace the idea that the sky really does belong to all of us, as the common “province of all mankind”. By paying rent for the right to exploit resources in space and royalties on production, the same way oil companies pay to exploit oil in the Gulf of Mexico, they’ll be engaging in business as usual. They will have bought the right to make a potentially enormous profit and prove they really are responsible global citizens. And they’d get a citizen’s dividend cheque too.