# 1AC R1 Emory

## 1AC

### Plan

#### Plan Text: The appropriation of outer space by private entities is unjust. The just appropriation of outer space as is a collective, international act under the Common Human Heritage principle as enforced by the United Nations. Pop 2k:

Pop, Virgiliu. "Appropriation in outer space: the relationship between land ownership and sovereignty on the celestial bodies." *Space Policy* 16, no. 4 (2000): 275-282.

Other authors try to "find solutions within the ambit of the current prohibition of national appropriation. They believe that **sovereignty in outer space is vested in the whole international society, be it represented or not by the United Nations**. **On the plane of property rights, this would confer the extraterrestrial lands the character of `public lands belonging to the international community.** In 1823, the US Supreme Court has decided in Johnson v. M+Intosh that `if the discovery is made on behalf of an existing government, that discovery becomes part of that nationa [32] and that under universal law, discovery of an uninhabited coun- try by individuals, not representing a government, ren- ders the discovery the property of the whole society which acquires in it &title in common [32**]. As Article V of the Outer Space Treaty qualifies astronauts as `envoys of mankinda, they do not represent a government and do not act on its behalf; they represent mankind and act on behalf of mankind**. When asked Did NASA claim the Moon as property of the United States when it planted a #ag on the Moon, like Colum- bus did when he landed in America?, the US Space Agency answered that **[w]hen a NASA astronaut placed the flag on the Moon, the action signified that, America went in peace for all Mankind'** [33]. Following the reasoning of the Johnson v M+Intosh judgement, **the Moon would be the property of the whole society which acquired in it title in common, i.e. a `res publica internationalis**. **This qualification clarifies both the `international law and `civil lawa situation of the moon as a territory: both sovereignty and property are public, i.e. vested in the international society.** This is very much in line with article II of the Outer Space Treaty. **The Moon is not nationally appropriated, but internationally. Land ownership is therefore also legitimated, but only in the hands of international society; the international public domain cannot be appropriated by private entities unless subsequently permitted**. **When referring to the international appropriation of the outer space and celestial bodies as permitted by the Outer Space Treaty, a fundamental issue needs clarification. International appropriation is not the sum of all the national appropriations**. Jenks correctly points that a State cannot escape the prohibition of national ap- propriation by acting jointly with other States. **Only as regards a possible appropriation by the United Na- tions acting on behalf of the world community as a whole can the matter be regarded as an open one for the future [8]. The Moon is not appropriated by the USA and Uganda and Cambodia and all the other States, but is instead appropriated by international society as a whole**, regardless of its individual components. As an individual is built from living cells, one cannot say that an object is owned by cell number 1 and cell number 2 and cell num- ber n. Cells may not own objects, while individuals may. States may not own the Moon, while international society may. A proposal advanced by Betancourt calls for ammending the Outer Space Treaty by providing for the sovereignty and jurisdiction over celestial bodies and natural space resources to be exercised by mankind [34, p. 309]. While the dimensions and the scope of the present article do not allow a detailed analysis of the term “humankind”, one must be aware of its twofold meaning as viewed by Dupuy, not only in its spatial dimension (international community), but also in its historical one, hu- mankind being `tomorrow even more than it is today [35, p. 484]. **It is the belief of the present author that humankind exercises sovereign rights on celestial bodies by the means of the United Nations. The owner of celestial bodies is humankind, exercising its ownership rights by means of the international community presently represented by the United Nations. Due to the temporal dimension of humankind, international community holds in trust outer space and celestial bodies for human- kind**

#### The status quo is unclear about the CHH: we must clarify and specify a specific regime, Jakhu et al 17:

Jakhu, R. S., & Pelton, J. N. (Eds.). (2017). *Global Space Governance: an international study*. Springer International Publishing. pg 398-400

**Many believe that any proper and sustainable legal regime related to space mining must be an international one based on widespread global consensus agreed within the UNCOPUOS and any relevant international forums. In this sense, there is now concern among the NewSpace community that the current international space law regime constitutes a key barrier, or perhaps even disincentive, to increased private sector involvement in space mining and related industries** [Jakhu & Buzdugan, 2008]. **Greater regulatory clarity concerning space activities is needed to ensure the further growth of emerging space industries such as space mining** [[Jakhu & Buzdugan, 2008; Tronchetti, 2009]. Some have suggested, therefore, that the best solution to overcome the current legal uncertainty would be the ratification of the 1979 Moon Agreement by the spacefaring nations [Jakhu & Buzdugan, 2008]. As discussed earlier, though the Moon Agreement appears to provide a better regime for development, that regime under the Outer Space Treaty strictly and comprehensively prohibits real property rights, though such approach/solution lacks any broad political consensus [Jakhu & Buzdugan, 2008; Hobe, 2007]. Article 11(5) of the Moon Agreement states that States undertake to establish an international regime for the exploitation of the natural resources of the Moon when such exploitation is about to become feasible. Article 11(7) establishes the criteria for such a regime: (a)  The orderly and safe development of the natural resources of the Moon; (b)  The rational management of those resources; (c)  The expansion of opportunities in the use of those resources; (d)  An equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries that have contributed either directly or indi- rectly to the exploration of the Moon, shall be given special consideration [Moon Agreement, art. 11(7)]. The creation of an international regime, as required by Article 11(5) of the Moon Agreement, can be used as an opportunity to negotiate the interpretation of the equi- table sharing provision of Article 11(7)(d) and to clarify its intended position. The international regime framework/provision can be shaped in ways suitable for the growth of space mining industry. **During the negotiation of the envisioned interna-tional regime, the principle of “common heritage of mankind**” [Moon Agreement, art. 11(1)] and the provisions of the Outer Space Treaty, particularly the Article II provision that no State can declare sovereignty over celestial bodies, **would need to be considered**. Another potentially useful model can be the ITU regime, which currently regu- lates and allocates space resources (i.e., radio frequency spectrum for telecommuni- cations services), and has been successful for many years with wide acceptance of its authority to manage global spectrum resources [Henri, 2004]. The ITU’s mem- bership as of the end of 2016 consists of 193 States plus over 800 private sector and academic institutions participants, and the organization is responsible for the alloca- tion of frequencies and geostationary slots on a global and equitable basis. If the naturally occurring space resources were to be perceived in this manner, they could be internationally regulated pursuant to public regimes and interests. It is worth noting, however, that radio frequencies are “renewable resources” in the sense that they can be reallocated with no loss of value (unlike physical space resources), and would, therefore, seem to require a different legal framework that addresses this difference. There is a point of some interest in that advocates of space mining have likened the activity to fishing in the oceans with the inference that new fish are constantly being resupplied or at least that there is an almost infinite supply of asteroids, bolides, and other space materials. **In the Western legal traditions, there are many ways to conceptualize public resources**. This is because there are several possible legal regimes that can make resources accessible to the public in different ways. **These ways to conceptualize public resources located beyond the sovereign of any particular State** **may be instructive in conceiving an effective and equitable model** in the use and sharing of space resources. **One way is to characterize a resource as not subject to appropriation by anyone (*res communis* in the terminology of Roman law). Historically, and to some extent today, this regime might apply in national law to the sea, the seashore, and to beds of navigable rivers. Alternatively, a resource may be characterized as belonging to no one until it is appropriated, at which time it belongs to the person/entity appro- priating it (*res nullius*).** This has traditionally been applied to abandoned things, but also to fugacious resources such as wildlife. In the modern world, however, it is now understood that it is necessary to place limits on the exploitation of such finite resources. This regulation may be through quotas, licensing, or other means. Regardless of the means of regulation chosen to regulate the exploitation of such resources, implicitly there is always a need for an independent institution in charge of authorizing and overseeing the process of exploitation. **Other modes of making resources public involve designating them as belonging to the State** (or the Crown). Since the State holds all of its assets for the public good, this always makes such resources public property, in a sense at least; but it does not neces- sarily mean that they are always readily available or accessible to the public. Thus government buildings and equipment may be considered public property, but the pub- lic do not always have access to them. Alternatively, resources designated as belong- ing to the State may well be made accessible to the public, either freely or not. Public parks may be freely open or may have access fees; radio frequencies have generally required applications and fees, and are now often allocated by auction. **However, the models of public property that depend on State ownership are not directly applicable to space and natural resources in space, since they are not in the territory of any State**. As argued before, analogies may be useful and provide practi- cal guidance to the fashioning of future governance systems. **Thus, the discussion on issues of global space governance might best draw some inspiration from the governance systems that have been adopted in relation to the high seas: there is a physical space that is outside the territory of any State, containing resources (e.g., mineral resources on the seabed, and fish and whales) which, in the modern world, are not inexhaustible, and for the common good, this shared “global commons” needs to be independently managed in the interests of everyone**. The UNCLOS and the international organizations that aim to implement provisions of the specialized regime governing the exploitation and use of resources derived from or located in the sea, such as the International Sea Bed Authority and International Whaling Commission, seem to be relevant examples. **A similar analysis seems to apply to tangible resources that may be available in space for extraction, such as minerals on celestial bodies in outer space. If it can be argued that such resources belong to no one until they are extracted, then one may well envision an international regulatory regime and accompanying institutions to regulate access to and the exploitation of space natural resources, especially when they are extracted on a commercial basis**. Indeed, the international regime (and possibly an associated international institution to oversee and enforce the regime) as envisioned under Article 11 of the Moon Agreement appears to be predicated toward avoiding conflicting claims and ensur- ing the equitable sharing and use of such resources found in the global commons.

#### Implementation as follows – Krekorian 18:

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| Kerkonian, Aram Daniel. "The Possible Regulation of Certain Space Activities through an International Orgnaization: Tutmonda Spaco Agentejo." *ZLW* 67 (2018): 279. |
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Having highlighted the seriousness of the multifaceted legal issues inherent in a num- ber of impending space activities and the **valuable role a TESA may play in addressing them**, what remains to be determined is how a TESA would address such issues, how it may be formed, what its mandate may include, how it could cultivate political buy- in without alienating national actors, how it may best meet the needs of humanity, the effect it will have on unifying the human species and how it may be used to bridge the inequality gap. The **proposed TESA may serve the function of solving today's, and preventing tomorrow's, crises in space if it is constructed in a flexible manner that allows for an a priori, immediate and effective reaction to space-based developments**; by **acting as an agent of all States**, it may do so in a manner that is **independent from national political interests** and **directed towards benefitting humanity**. Sovereignty is the bedrock of international relations. Following the Treaty of West- phalia, the concept of an independent, autonomous State emerged alongside the rec- ognition that all States are equally independent and autonomous. These twin concepts have since coloured international relations and States, as the supreme authority within a defined territory, remain the dominant players. It is for this reason that **accomplish- ing anything international is the result of cooperation**: it takes the unified effort of in- dividual States to decide and move towards any international objective. This supreme authority, however, is curtailed by certain realizations, such as the fact that **individual actions of one State may interfere with the sovereignty of another**. Underlying this realization is the fact that **all States, as individuals, are only one part of the whole**. As such, **cooperation is key** and nowhere is this truer than in outer space. The **laws of physics make it impossible to divide outer space** - particularly the Earth's orbits - **into discernible territories** with which we are familiar on Earth. Celestial bodies and space objects are in constant motion and cannot be made to simply "rest" in a particular spot in space over which a State may have authority. As a result, **every activity in space has the potential to affect every other activity in space. Determining how space is used, therefore, is one of mutual concern to all States** whether space- faring or not: to this end, **international cooperation is the key** and **the reason why the 42 space treaties place it in such high regard**. Presently, as our use and reliance on outer space continues to grow, **space actors will find that such cooperation is increasingly important**. Moving forward, **there will be a need for an international organization that can act as an agent of all States**, preserving and promoting their mutual interests in outer space. **A TESA would characterize the pinnacle of international cooperation that is nec- essary to maintain our use of outer space and would necessarily require individual States to empower it with such capabilities**. This will **require States to cede some of their sovereign decision-making powers to a TESA** for their own long-term benefit. Such authority would only come about after States agree on establishing such a TESA and outlining its mandate and expected role. While it is true that relinquishing sover- eignty is never a State's priority, it can be in its interest; **recognizing that each State is but an individual actor for humanity, creating an agency that would follow an agreed mandate to benefit all parties will be palatable**; for all the reasons outlined above, a **TESA would be a particularly suited for this task**. Critics will no doubt point to the many obstacles associated with creating a new in- ternational organization, let alone **one that would seemingly relegate national sov- 43 ereignty in space** . There is value in investigating such criticisms and determining whether they are mere hesitations to change or whether they are fatal to the creation of the proposed TESA. The author suspects that the theme of such criticisms is that political agreement is at an all-time low and creating such a system would prove ex- tremely difficult - while true, these are criticisms of a motivational rather than legal nature and can be overcome with concerted effort. 44 The **creation of a TESA**, while an ideological first in the realm of space, **would not be unprecedented**. The **United Nations system offers numerous examples** of situations demanding collective action where interests would be best served by creating an in- 45 ternational fund, programme, specialized agency or other body. The **organization bearing the most foundational resemblance to the proposed TESA** would be the **In- ternational Telecommunications Union**. Founded in 1865 upon **realizing the need for coordination and cooperation in telegraph, telephone and later telecommunications services**, the ITU is considered one of the most successful UN agencies, having ad- dressed numerous developments over its 150-year existence. The ITU is also unique in that it allows for the participation of private industry in combination with member States (albeit in a non-voting capacity), a model that maybe replicable in a TESA.

#### The aff defines outer space in accordance with the 1967 Outer Space Treaty to include celestial bodies and all space outside of low earth orbit.

### Adv 1 – Debris

#### Private space appropriation leads to a massive increase in space junk, Holden 18:

John Holden, July 12, 2018, The Irish Times, Why space capitalism will eat itself, https://www.irishtimes.com/business/innovation/why-space-capitalism-will-eat-itself-1.3556368

Which is great because when it comes to exploring space the end justifies the means. But now we must deal with the fallout from turning our galaxy into another market. Wild West It would be trite to compare the commercial space sector to the American Wild West. But with no one policing the burgeoning industry, **businesses operate untethered in a market where there are no rule**s and no open channels of communication**. It means satellites are launched unchecked every day by anyone** – from the amateur enthusiast in her back garden to major international space co-operatives. **It’s nearly impossible to know what’s really going on up there**. US officials believe there are about half a million man-made objects floating around in orbit. But that’s about as specific as they can get. Not very scientific. The only thing more predictable than tired Wild West analogies is the human species itself. We are a predictable bunch, prone to making the same mistakes over and over. As such, we enter a new era where space pollution is an issue. What could be a more iconic symbol of our wretched love for creating waste than flying devices designed never to return? Earlier this year, India broke all previous records by launching 104 satellites at once into orbit. Cool. Except those 104 satellites are destined to become 104 (or more) pieces of trash floating around in space. That’s right. Satellite technology, in its current state, is the new “lightbulb” of planned obsolescence. What could be a more iconic symbol of our wretched love for creating waste than flying devices designed never to return? When a satellite’s mission is complete, or it malfunctions, it’s gone. Girl, bye. **“Space junk” makes up a significant proportion of the guesstimated 500,000 plus objects floating around in orbit. About 23,000 of these objects are currently being tracked and maintained by the US Strategic Command. These so-called resident space objects are either satellites still in use or are known objects no longer fit for purpose. They could be as small as a tennis ball or the size of a double decker bus. I**n addition, however, **there are hundreds of thousands of other objects – bolts, exploded satellite pieces, large rockets and other space debris – that are unaccounted for. Efforts have been made to try to consolidate public with private data on what is up there but, for various reasons, the space community does not openly share information on where all objects are located.** Lack of regulation For the entrepreneurially inclined, it is probably not that surprising to hear **many are taking advantage of the severe lack of regulation in space**. Sure why wouldn’t you? Moreover why would anyone publicly disclose how and where their interests lie in a given market, intergalacticor otherwise, if they weren’t obliged to? But space isn’t just another market. Thinking one can apply the same rules up there as we use on earth is shortsighted for so many reasons. Down here the economic “unknowns” are known. Space is replete with unknown unknowns. If a satellite that is used to collect data to sell on to business customers one day stops sending data, and you haven’t the foggiest notion why, what do you tell the customers? How do you attribute cause? How does a company predict the likelihood of loss or damage to its equipment in space or perform other prudent exercises before getting into the space game? One of the chief concerns for any new business is risk and how to mitigate it. There couldn’t be a much riskier bet than entering a market with no regulation, patchy knowledge of your competitors’ location or size, and to top it all off, little understanding of the physical environment within which the business will operate. Until everyone is economically incentivised to behave responsibly in space, the chaos will continue. With aplomb. It won’t last forever though. The current lack of regulation is, in itself, the mother of all gaps in the biggest market civilization may ever exploit. And the Trump administration is the first to corner it. Suddenly the decision to give responsibility for space traffic management issues to the commerce department, and not the FAA, begins to make sense.

#### Approval of tech to stop space debris is impossible b/c of current legal frameworks, only the aff solves, Krerkonian 18:

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| Kerkonian, Aram Daniel. "The Possible Regulation of Certain Space Activities through an International Orgnaization: Tutmonda Spaco Agentejo." ZLW 67 (2018): 279. |
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**Every actor engaged in space activities realizes that space debris continues to increase 4 unabated and poses a threat to current and future space operations**. 5 Avoiding a Kes- sler runoff' (which would make space inaccessible for hundreds of years) is to ev- eryone's benefit and yet **we have made no progress in remedying the situation since realizing it in 1978**. While some efforts have slowed the intentional creation of new debris, the more **serious challenge of removing existing debris remains unaddressed**. **Although viable technological solutions have been proposed** for decades, the **legal realities of space prevent the implementation of such** promising solutions. 8 19 The **established legal regime carefully assigns responsibility , liability and juris- 20 diction and control on the basis of particular factors, often designating different States to each legal characteristic**. Since **every debris remediation attempt requires the consent of the State that has jurisdiction on a case-by-case basis** (regardless of whether we are considering a functioning satellite, a spent fuel tank or a dislodged paint chip), **approval is complicated and sometimes impossible** (for example, with unidentifiable debris ). To make matters worse, since **liability attaches to a launching State** (whose consent is not necessary unless they are also the State of registry) **if dam- age occurs during a remediation they did not consent to, the determination of fault becomes highly convoluted**. Further, the **current political climate makes it unlikely for major space faring nations to enter remediation efforts with each other over fear of having their on-board data hacked or having their protected technologies reverse- engineered**. Could a **TESA serve as a platform upon which to refine debris remediation technolo- gies and capabilities, establish a fund to insure against damage caused by remediation efforts or acquire waivers from all space faring nations consenting to the remediation of unidentified debris**? Equally importantly, would the **international and non-partial character of a TESA instill confidence** in individual States that **remediated objects would not be used for nefarious purposes**? Could a TESA **act on behalf of humanity** to preserve access to near-space for generations to come? If space is to be used to benefit all people, cleaning-up and maintaining the space environment is of monumental importance and a TESA would be well placed to ensure its sustainability.

#### It cascades---nuclear war.

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 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.

#### Nuclear war causes extinction – ozone losses, firestorms, and agricultural disruption, Starr 17:

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The detonation of an atomic bomb with this explosive power will instantly ignite fires over a surface area of three to five square miles.In the recent studies, the scientists calculated that the blast, fire, and radiation from a war fought with 100 atomic bombs could produce direct fatalities comparable toall of those worldwide in World War II, or to those once estimated for a “counterforce” nuclear war between the superpowers. However, the long-term environmental effects of the war could significantly disrupt the global weather for at least a decade, which would likely result in a vast global famine. The scientists predicted that nuclear firestorms in the burning cities would cause at least five million tons of black carbon smoke to quickly rise above cloud level into the stratosphere, where it could not be rained out. The smoke would circle the Earth in less than two weeksand would form a global stratospheric smoke layer that would remainfor more than a decade. The smoke would absorb warming sunlight, which would heat the smoke to temperatures near the boiling point of water, producing ozone losses of 20 to 50 percent over populated areas. This would almost double the amount of UV-B reaching the most populated regions of the mid-latitudes, and it would create UV-B indices unprecedented in human history. In North America and Central Europe, the time required to get a painful sunburn at mid-day in June could decrease to as little as six minutes for fair-skinned individuals. As the smoke layer blocked warming sunlight from reaching the Earth’s surface, it would produce the coldest average surface temperatures in the last 1,000 years. The scientists calculated that global food production would decrease by 20 to 40 percent during a five-year period following such a war. Medical experts have predicted that the shortening of growing seasons and corresponding decreases in agricultural production could cause up to two billion people to perish from famine. The climatologists also investigated the effects of a nuclear war fought with the vastly more powerful modern thermonuclear weapons possessed by the U**nited** S**tates**, Russia, China, France, and England. Some of the thermonuclear weapons constructed during the 1950s and 1960s were 1,000 times more powerful than an atomic bomb. During the last 30 years, the average size of thermonuclear or “strategic” nuclear weapons has decreased. Yet today, each of the approximately 3,540 strategic weapons deployed by the United States and Russia is seven to 80 times more powerful than the atomic bombs modeled in the India-Pakistan study. The smallest strategic nuclear weapon has an explosive power of 100,000 tons of TNT, compared to an atomic bomb with an average explosive power of 15,000 tons of TNT. Strategic nuclear weapons produce much larger nuclear firestorms than do atomic bombs. For example, a standard Russian 800-kiloton warhead, on an average day, will ignite fires covering a surface area of 90 to 152 square miles. A war fought with hundreds or thousands of U.S. and Russian strategic nuclear weapons would ignite immense nuclear firestorms covering land surface areas of many thousands or tens of thousands of square miles. The scientists calculated that these fires would produce up to 180 million tons of black carbon soot and smoke, which would form a dense, global stratospheric smoke layer. The smoke would remain in the stratosphere for 10 to 20 years, and it would block as much as 70 percent of sunlight from reaching the surface of the Northern Hemisphere and 35 percent from the Southern Hemisphere. So much sunlight would be blocked by the smoke that the noonday sun would resemble a full moon at midnight. Under such conditions, it would only require a matter of days or weeks for daily minimum temperatures to fall below freezing in the largest agricultural areas of the Northern Hemisphere, where freezing temperatures would occur every day for a period of between one to more than two years. Average surface temperatures would become colder than those experienced 18,000 years ago at the height of the last Ice Age, and the prolonged cold would cause average rainfall to decrease by up to 90%. Growing seasons would be completely eliminated for more than a decade; it would be too cold and dark to grow food crops, which would doom the majority of the human population.

### Adv 2 – Asteroids

#### The Earth is overdue for asteroid strikes and is underprepared – only unified national efforts can solve, which private appropriation makes impossible, Krerkonian 18:

Kerkonian, Aram Daniel. "The Possible Regulation of Certain Space Activities through an International Orgnaization: Tutmonda Spaco Agentejo." ZLW 67 (2018): 279.

**Statistically, planet Earth is 10,000 years overdue for a significant asteroid strike**"; **protecting the planet** from such a strike **requires the ability to detect, track and alter the orbit of an asteroid**. While **individual States have developed certain extremely** 26 **limited capabilities, they remain powerless in the face of a serious threat**. **Even if**, however, **a State had the capability to stop an asteroid, legal questions remain**: **can it act unilaterally? Must it consider the interests of other States? How would it perform risk assessments**? Further, the **tools necessary to stop an asteroid** (such as lasers or nuclear-powered space objects) **could likely also be used as weapons: would other 2 States perceive such preparatory activities as military positioning**? Would this vio- 2 late established law? 8 Realistically, **effective planetary protection cannot be conducted by one State. What is required is a** **concerted global effort to upgrade our detection and tracking capa- bilities, establish programmes to avert asteroids and develop protocols to respond to disasters**. Would a TESA be well suited to carry out these tasks? Would its **interna- tional composition offer impartiality** in decision making, **transparency** in the use of dual-purpose technologies and an unmatched **collective expertise** when dealing with emergencies? Of course, asteroid strikes are only one threat a body tasked with plan- 29 etary protection must address. Regardless of the nature of the threat, however, when the planet and all of its inhabitants are at risk, **authority ought to be wielded by an organization representing the diverse interests of humanity** rather than a single State.

#### An asteroid collision would ensure extinction – would fundamentally alter the biosphere, don’t underestimate its risk

Wesley Hudson ’19, news reporter for Express, “Asteroid alert: NASA warning as kilometre long space rock set to skim Earth at 25,000mph”, 8/28/19, Express, https://www.express.co.uk/news/science/1170826/asteroid-news-NASA-latest-space-rock-asteroid-1998-HL1-earth-danger-apocalypse

AN ASTEROID almost a kilometre wide is currently barreling through space at more than 25,000mph and is due to skim the earth towards the end of October. NASA’s Jet Propulsion Laboratory (JPL) claim the space rock will shoot past the earth within a “close” proximity of the planet in the early hours of October 26. The asteroid, dubbed 1998 HL1, is a so-called Near-Earth Object (NEO) flying on a Close Approach Trajectory. NASA expects the 1998 HL1 to come flying by dangerously close around 1.21am BST (17.21pm PDT). The daunting moment will mark anther journey around the sun for the asteroid since it was discovered in 1998. The asteroid will be travelling at a staggering speed of over 25,000mph as it barrels past the Earth. The JPL predict the asteroid could be between 440m and 990m wide. At its largest an asteroid of this size is bigger than the tallest building in the world, the Burj Khalifa in Dubai. Even at it’s smallest, 1998 HL1 is still bigger than The Shard. Since it was discovered, 1998 HL1 has been seen up to 408 times. An NEO is an asteroid or comet which is on an orbital path intersecting that of the Earth's. This asteroid will miss the Earth by almost four million miles. If it were to strike the Earth, an asteroid of this size would cause catastrophic damage. The extinction of the dinosaurs in the Cretaceous-Tertiary event 65million years ago is famously believed to have been caused by a massive asteroid impact. The Chicxulub Crater in Mexico is the most commonly accepted point of impact, with the responsible body thought to be around 10km in diameter. A car-sized asteroid is estimated to hit the Earth roughly once a year. The majority of asteroids on track for the planet are usually burnt up as they enter the Earth's atmosphere. NASA administrator Jim Bridenstine has previously warned a potential asteroid collision is more likely then people realise. He said: "We have to make sure that people understand that this is not about Hollywood, it's not about the movies. "This is about ultimately protecting the only planet we know, right now, to host life - and that is the planet Earth.” NASA is currently in the process of developing the Double Asteroid Redirection Test (DART). DART will test if it is possible to redirect asteroids that are threatening to impact with Earth. SpaceX chief Elon Musk had previously tweeted fears of a deadly collision that Earth was not prepared for. Mr Musk tweeted: “A big rock will hit Earth eventually & we currently have no defence.”sase

#### Don’t write our impacts off as low probability – asteroid collision is complex and the existence of space keyholes exponentially increases the risk of collision

Peter Vereš ’19, Harvard-Smithsonian Center for Astrophysics, “Chapter 6 Vision of Perfect Observation Capabilities”, 2019, Planetary Defense, Space and Society, https://dl1.cuni.cz/pluginfile.php/634091/mod\_resource/content/1/Planetary%20Defence.pdf

Often, uncertain orbits are a source of elevated impact risks of some NEOs with the Earth. The impact probability of an asteroid with Earth is a complex problem. First, the orbits of Earth and the asteroid should be close enough or even intersect; second, the Earth and asteroid should meet at the intersection at the same time. If these conditions are met, then one can assess how close the asteroid flies around the Earth at a given time, or whether it will hit the Earth. One must remember that each asteroid orbit comes with uncertainties and therefore, instead of a single accurate solution where the asteroid will hit the Earth or miss it, there is always a realm of possible solutions within the orbit uncertainties. The tangent plane to the asteroid’s trajectory at the time of impact, or close approach, is called a b-plane. At a given time of a predicted impact, all possible closest distances to the Earth of possible orbits create an area on the tangent plane. If the area contains the Earth, then the impact probability for that epoch is non-zero and in a simple approximation can be denoted as a ratio of an area of Earth cross section and the entire area with possible orbits going through the b-plane. It happens that a newly discovered NEO with a short arc that is coming very close to the Earth has a non-zero impact probability, because its orbit is highly uncertain and the area on the b-plane is very large. Typically, further observations improve the orbit, and the impact risk for a given epoch falls to zero. Some objects, however, have orbits with low orbital uncertainty, but still have non-zero impact probability, such as Bennu. The non-zero impact probability is computed for a given time in the future, but even if the orbit is known very well today, small perturbations from planets and non-gravitational forces increase the uncertainty for future impacts. That is why NASA’s Sentry is providing predictions only for the next 100 years. A close flyby of a spacecraft around an asteroid may improve the asteroid’s orbit significantly, however, it does not fully mitigate its impact in the future, due to the presence of keyholes (Chodas 1999)—small areas in space near Earth. Keyholes are specific for asteroids flying very close to the Earth and are rather small, from a few to hundreds of kilometers across. If the keyhole is hit during the NEO flyby, the orbit of the NEO becomes resonant with Earth and the NEO will return to Earth regularly, increasing its impact probability. Thus, in case of a very near Earth flyby, the orbit needs to be known with such precision (~km) that keyhole avoidance is confirmed. NASA has even created the NEO Deflection App,1 where the public can try to change the orbit of a hypothesized NEO on direct impact trajectory. For Earth impact monitoring, the accuracy of orbits and orbital uncertainties is crucial and deserves more attention. The future of orbit determination and uncertainty mitigation will depend more and more on sophisticated software that will be able to handle orbital computation in detail; assess uncertainties and errors of measurements; coordinate a list of objects that are crucial for follow-up or orbit improvement, or even automatically point the telescopes in a network to observe those asteroids; measure their positions; and submit the data to MPC. This automated process is more or less implanted by several surveys (CSS, LCOGT) and agencies (ESA, MPC).

## FWK

#### Pain and pleasure are intrinsically valuable – to justify beyond that runs into moral incoherence. Moen 16,

Moen 16 [Ole Martin Moen, Research Fellow in Philosophy at University of Oslo “An Argument for Hedonism” Journal of Value Inquiry (Springer), 50 (2) 2016: 267–281] SJDI // RCT by JPark

Let us start by observing, empirically, that a widely shared judgment about intrinsic value and disvalue is that pleasure is intrinsically valuable and pain is intrinsically disvaluable. On virtually any proposed list of intrinsic values and disvalues (we will look at some of them below), pleasure is included among the intrinsic values and pain among the intrinsic disvalues. This inclusion makes intuitive sense, moreover, for there is something undeniably good about the way pleasure feels and something undeniably bad about the way pain feels, and neither the goodness of pleasure nor the badness of pain seems to be exhausted by the further effects that these experiences might have. “Pleasure” and “pain” are here understood inclusively, as encompassing anything hedonically positive and anything hedonically negative.2 The special value statuses of pleasure and pain are manifested in how we treat these experiences in our everyday reasoning about values. If you tell me that you are heading for the convenience store, I might ask: “What for?” This is a reasonable question, for when you go to the convenience store you usually do so, not merely for the sake of going to the convenience store, but for the sake of achieving something further that you deem to be valuable. You might answer, for example: “To buy soda.” This answer makes sense, for soda is a nice thing and you can get it at the convenience store. I might further inquire, however: “What is buying the soda good for?” This further question can also be a reasonable one, for it need not be obvious why you want the soda. You might answer: “Well, I want it for the pleasure of drinking it.” If I then proceed by asking “But what is the pleasure of drinking the soda good for?” the discussion is likely to reach an awkward end. The reason is that the pleasure is not good for anything further; it is simply that for which going to the convenience store and buying the soda is good.3 As Aristotle observes: “We never ask [a man] what his end is in being pleased, because we assume that pleasure is choice worthy in itself.”4 Presumably, a similar story can be told in the case of pains, for if someone says “This is painful!” we never respond by asking: “And why is that a problem?” We take for granted that if something is painful, we have a sufficient explanation of why it is bad. If we are onto something in our everyday reasoning about values, it seems that pleasure and pain are both places where we reach the end of the line in matters of value.

#### Thus, the standard is maximizing expected well-being (Act Util). Prefer additionally:

#### 1] Lexical pre-req. Threats to bodily security and life preclude the ability for moral actors to effectively act upon other moral theories since they are in a constant state of crisis. This means my offense OW under their fwk.

#### 2] Actor specificity

#### A] governments must aggregate because their policies benefit some and harm others so the only non-arbitrary way to prioritize is by helping the most amount of people

#### B] Actor specificity comes first because different agents have different obligations. Takes out calc indicts because they’re empirically denied.

#### 3] Degrees of wrongness – only consequences can explain why some actions are better or worse than others – breaking a promise to take someone to lunch isn’t as bad as breaking a promise to take a dying person to the hospital but only the consequences of breaking it can explain why, so all ethical theories collapse to util.

#### 4] Topic lit – most articles are written through the lens of util since they’re crafted for policymakers and the general public to understand who take consequences to be important, not philosophy majors. Leads to better real world ed, important because that is the terminal impact of debate. Not a reason to drop the debater.

#### 5] Extinction hijacks and side constrains the framework – it o/w and comes first

Pummer 15 [Theron, Junior Research Fellow in Philosophy at St. Anne's College, University of Oxford. “Moral Agreement on Saving the World” Practical Ethics, University of Oxford. May 18, 2015] AT

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

## UV

#### **1] Cx checks solves – the neg can read infinite interps which can easily be prevented by asking in cross. No abuse if I provide whatever necessary before their prep.**

#### **2] 1AR theory paradigm –**

#### **a] grant me it else infinite abuse – neg won’t have any deterrence**

#### **b] drop the debater because the 1ar is too short to win theory and substance**

#### **c] no RVIs – the 2nr has enough time and the 2ar needs strategic flexibility**

#### **d] competing interps – 1ar interps aren’t bidirectional and Cis are best for normsetting**

#### **1ar theory first – Strat skew – short 2AR needs collapse to counter the long 2N collapse**

#### **3] No omissions: All neg theory violations and kritik links must come from the text of the AC, not the absence of specification.**

#### **a] I have a limited time to speak so it’s an infinite aff burden**

#### **b] they can always make some sort of shell or link even if I don’t do anything which allows for infinite neg abuse.**