# 1NC R1 TOC (Phil)

## 1

#### Counterplan text: The Committee on the Peaceful use of Outer Space ought to establish an application system for property rights on celestial bodies. Applications and approval of property rights should be granted upon the condition of

#### open disclosure of data gathered in the exploration of a celestial body

#### Applications must be publicly announced

#### Property Rights will be made tradeable between private entities

#### Property Rights will be set to expire on the conclusion of a successful extraction mission

#### Private Entities will only be allowed one property right grant per celestial body and cannot have more than one grant at a time

**Steffen 21** [Olaf Steffen, Olaf is a scientist at the Institute of Composite Structures and Adaptive Sytems at the German Aerospace Center. 12-2-2021, "Explore to Exploit: A Data-Centred Approach to Space Mining Regulation," Institute of Composite Structures and Adaptive Systems, German Aerospace Center, [https://www.sciencedirect.com/science/article/pii/S0265964621000515 accessed 12/12/21](https://www.sciencedirect.com/science/article/pii/S0265964621000515%20accessed%2012/12/21)] Adam

4. The data-centred approach to space mining regulation

4.1. Core description of the regulatory regime and mining rights acquisition process

The data gathered in the exploration of a [celestial body](https://www.sciencedirect.com/topics/social-sciences/astronomical-systems) is not only of value for space mining companies for informing them whether, where and how to exploit resources from the body in question, but also for science. The irretrievability of information relating to the solar system contained in the body that will be lost during resource exploitation carries a value for humanity and future generations and can thus be assigned the characteristic of a common heritage for all mankind as invoked in the Moon Agreement. This characteristic makes exploration data an exceptional and unique candidate for use in a mechanism for acquiring mining rights because its preservation is of public interest and its disclosure in exchange for exclusive mining rights does not place any additional burden on the mining company. The following principles would form the cornerstones of the proposed regulatory regime and rights acquisition mechanism based on exploration data:

Without preconditions, no entity has a right to mine the resources of a celestial body.

An international regulatory body administers the existing rights of companies for mining a specific celestial body.

Mining rights to such bodies can be applied for from this international regulatory body, with applications made public. The application expires after a pre-set period.

Mining rights are granted on the provision and disclosure of exploration data on the celestial body within the pre-set period, proposedly gathered in situ, characterising this body and its resources in a pre-defined manner.

The explorer's mining right to the resources of the celestial body is published by the regulatory body in a mining rights grant.

The data concerning the celestial body are made public as part of the rights grant within the domain of all participating members of the regulatory regime.

The exclusive mining rights to any specific body are tradeable.

The scope of the regulatory body with respect to the granting of mining rights is not revenue-oriented.

The international regulatory body would thus act as a curator of a rights register and an attached database of exploration data. The concept is superficially comparable to patent law, where exclusive rights are granted following the disclosure of an invention to incentivise the efforts made in the development process. In the following section, the characteristics of such a regulatory regime are further discussed with respect to the formation of [monopolies](https://www.sciencedirect.com/topics/social-sciences/monopolies), market dynamics, conflict avoidance, inclusivity towards less developed countries and the viability of implementation.

4.2. Discussion and means of implementation

The proposed regulatory mechanism has advantages both from a business/investor and society perspective. First, it prevents already highly capitalised companies from acquiring exploitation rights in bulk to deny competitors those objects that are easiest to exploit or most valuable, which would otherwise be possible in any kind of pay-for-right mechanism and could result in preventing market access to smaller, emerging companies. Thus, early monopoly formation can be avoided.

The use of data disclosure for the granting of mining rights ensures the scientific community has access to this invaluable source of information. In this way, space mining prospecting missions can lead to a boost in research on small celestial bodies at a speed unmatchable by pure government/agency funded science probes. This usefulness to the scientific community could lead to sustained partnerships between prospecting companies and scientific institutions and could even provide a source of funding for the companies through R&D grants and public-private partnerships. The results of the exploration efforts contribute to research on the formation of planets and the history of the solar system and provide valuable insight for space defence against asteroids. The transition of exploration from a tailored mission profile with a purpose-built spacecraft to a standard task in space flight would also lead to a cost reduction of the respective exploration spacecraft through [economies of scale](https://www.sciencedirect.com/topics/social-sciences/economies-of-scale). This describes the very benefits Elvis [[24](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib24)] and Crawford [[25](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib25)] imagined as possible effects of a space economy. Thus, there is an immediate return for society from the exploitation rights grant. It also reconciles the adverse interests of space development and [space science](https://www.sciencedirect.com/topics/social-sciences/space-sciences) as laid out by Schwartz [[26](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib26)]. It ensures that, by exploitation, information contained in celestial bodies is not lost for future generations.The application period should not be set in a manner that creates a situation that can be abused through the potential for stockpiling inventory rights. Rather, it is intended to prevent conflict in the phase before exploration data gathered by a mission, as a prerequisite to the mining rights grant, is available. In other words, only one exploration effort at a time can be permitted for a specific body. The time frame between the application and the granting of mining rights (meaning: availability of the required exploration data set) should be tight and should only consider necessary exploration time on site, transit time and possibly a reasonable launch preparation and data processing markup. These contributors to the application period make it clear that the time frame could be dynamic and individualistic, depending on the exploration target (transit time and duration of exploration) and the technology of the exploration probe (transit time). After the expiration of the application period, applications for the exploration target would again be permissible. To prevent the previously mentioned stockpiling of inventory rights, credible proof of an imminent exploration intention would need to be part of the application process, for example, a fixed launch contract or the advanced build status of the exploration probe. Such a mechanism would not contradict the statement in the OST that outer space shall be free for both exploration and scientific investigation. Applications would not apply to purely scientific exploration. An application would only be necessary as a prerequisite for mining. Even resource prospecting could take place without an application (for whatever reason), with a subsequent application comprising in situ data already gathered. For such cases, the application process would need to provide a short period for objections to enable the secretive explorer to make their efforts public. The publication of the application for the mining rights, which is nothing more than a statement of intention to explore, thus provides a strong measure for avoiding conflict.

The transparency of where exploration spacecraft are located and, at a later stage, where mining activities take place, provides additional benefits for the sustainable use of space, trust building and deterrence against malign misuse of mining technology. Involuntary spacecraft collisions of competitors in deep space are prevented by the reduction of exploration efforts at the same destination through the application for mining rights by one applicant at a time. As pointed out by Newman and Williamson [[20](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib20)], this is relevant because space debris does not de-orbit in deep space as in the case of LEO. Deep space may be vast, but the velocities involved mean that small debris particles are no less dangerous. Considering NEO mining with fleets of small spacecraft, malfunctions and/or destructive events could create debris clouds crossing Earth's orbit around the sun on a regular basis, presenting another danger to satellites in Earth's own orbit. Thus, by effectively preventing the collision of two spacecraft, one source of debris creation can be mitigated through this regulation mechanism. With respect to Deudney's [[11](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib11)] scepticism of asteroid mining and the dual-use character of technology to manipulate orbits of celestial bodies, it has to be stated that this potential is truly inherent to asteroid mining. An asteroid redirect mission for scientific purposes was pursued by NASA [[49](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib49)] before reorientation towards a manned lunar mission. In one way or another, each type of asteroid mining will require the delivery of the targeted resource to a destination via a comparable technology as formerly envisioned by NASA, be it as a raw material or a useable resource processed in situ, even if this is not necessarily done through redirecting the whole asteroid and placing it in a lunar orbit. However, to be misused as a weapon, space mined resources would have to surpass a certain mass threshold to survive atmospheric entry at the target. This seems unfeasible for currently discussed mining concepts using small-scale spacecraft as described in this article. Redirecting larger masses or whole asteroids would require far more powerful mining vessels or small amounts of thrust over long periods of time. The continuous, (for a mining activity) untypical change in the orbit of an asteroid would make a redirect attempt with hostile intent easily identifiable, effectively deterring such an activity in the first place by ensuring the identification of the aggressor long before the projectile hits its target. The proposed database would provide a catalogue of asteroids with exploration and mining activities in place that should be tracked more closely because of their interaction with spacecraft. This would, in fact, be necessary per se as a precaution to avoid catastrophic mishaps, such as the accidental change of a NEO's orbit to intercept Earth by changing its mass through mining.

#### The right to humanity as our own person necessitates property – infringing on someone else’s body is unethical and not universalizable

**General Law 15** General Law. "Poverty and Property in Kant’s System of Rights |." *https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/*, 30 Oct. 2015, lawexplores.com/poverty-and-property-in-kants-system-of-rights/. Accessed 7 Apr. 2022.

Kant’s account of property in the Doctrine of Right features a conceptual progression that starts from the innate right to freedom and culminates in the establishment of property as an institution of positive law.[24](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn24) Kant exhibits the phases of this progression as implicit in the relationship of free persons under the conditions of human existence. Because property is consistent with the freedom of all, it is rightly secured and protected by the law’s coercive powers. This progression has three phases, which Kant presents from a variety of standpoints as befits their structural importance. Sometimes he describes these phases in terms of the categories of modality (the possibility, the actuality, and the necessity of possessing objects).[25](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn25) Sometimes, he refers to them as divisions of justice (*iustitia tutatrix, iustitia commutativa, iustitia distributiva*).[26](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn26) Sometimes he refers to the division of duties that accompanies the divisions of justice.[27](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn27) Sometimes he refers to these phases in terms of form and matter.[28](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn28) Sometimes he calls them different variations of right (what is intrinsically right, what is rightful, what is laid down as right)[29](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn29) or different kinds of laws of justice (*lex iusti, lex iuridica, lex iustitiae*).[30](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn30) However the phases are referred to, the progression through them exhibits a dialectical structure of argument.[31](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn31) In the first phase Kant starts with the universal principle of Right, which mandates the coexistence of one person’s action with another’s freedom under a universal law, and notes the juridical relationship analytically contained within that principle. This juridical relationship does not include property in external things, but it does encompass certain “authorizations” such as equality and non-dependence,[32](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn32) which are normative attributes implicit within the universal principle of Right and therefore ascribable to the parties at this phase. In the second phase he extends this initial argument on the ground that having something external as one’s own, although not analytically contained in the universal principle of Right marks a connection to external things that matches the capacity for choice characteristic of self-determining action. This extension, however, is problematic, because although ownership of external things is now permissible, it is not yet put into effect under conditions consonant with the authorizations articulated in the first phase. The second phase, accordingly, is merely provisional. The problems it raises are resolved at the third phase, where the conditions of acquisition take a form that is fully consistent with what was analytically contained in the universal principle of Right. As Kant puts it with unfortunate opacity when he lists the threefold division of duties, the duties of the third phase “involve the derivation of the [duties of the second phase] from the principle of the [duties of the first phase] by subsumption.”[33](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn33) Although presented in a sequence, these three phases are conceptual, not temporal. Kant is not offering a philosophical reconstruction of the historical evolution of property. Rather, the three phases represent aspects that together are constitutive of property in the juridical relationships of free persons (e.g., that external things can be acquired through acts of will, that property does not require actual possession, that property rights are enforceable, and so on), but presented in an ordering that purports to show property’s normative necessity within a system of rights. The three phases comprise an articulated unity: each phase proceeds with its distinct mode of argumentation (the first is analytic, the second is synthetic, the third works by subsumption), but the account of property stands or falls on the totality of the three phases taken together. Kant himself presents property as absent at the first phase and as problematic at the second. If these phases were considered independently, the argument would not get off the ground or would collapse as soon as it did so. Nor does the third phase stand alone either; its role is to incorporate what is necessary to reconcile the second phase to what is analytically contained in the first one. The result is that the institutions of public law that emerge at the third phase determine and guarantee the property entitlements that are the product of the second phase in a way that expresses the normative significance of the principle of right that initiated the first phase. The first phase features the innate right to freedom. The innate right to freedom consists in the independence of one’s actions from constraint by the actions of another, insofar as such independence is consistent with the freedom of everyone else.[34](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn34) This right stands in an analytic relationship with the universal principle of Right, which requires that one person’s action be able to coexist with the freedom of everyone under a universal law. Formulating freedom as an innate right adds nothing to what the universal principle already contains; it merely isolates a constituent element of, and represents what is already involved in thinking about, that principle. The innate right is “the only original right belonging to every man by virtue of his humanity.”[35](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn35) This right is innate because every person has it simply by virtue of his or her existence. Similarly, it is original because it arises independently of any act that would establish it. Because my innate right is not mine by virtue of some act of acquisition, it is what is internally mine, in contrast to what is externally mine, which must always be acquired.[36](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn36) What is internally mine is my freedom[37](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn37)—that is, my capacity to act in the execution of the purposes I form as a self-determining being. For human beings the paradigmatic manifestation of what is internally mine is the body, the physical organism through which the person expresses his or her freedom as a self-determining being.[38](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn38) By mandating actions that can coexist with the freedom of all, the universal principle of Right signals its application to the actions of self-determining agents. In the case of human beings, self-determining activity takes place through the body. Because the body is an “inseparable unity of members in a person,”[39](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn39) interference with any part of another’s body is a wrong against that person’s freedom. This right with respect to one’s own body is innate. It arises not through the performance of an act of acquisition (indeed, no such act is conceivable because the body itself is what would have to perform it), but simply by virtue of one’s being born. Thus, the body is the primary locus of what Kant calls the “right of humanity in our own person.”[40](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn40) The occupation by a person’s body of a particular space is an exercise of this right: “All men are originally (i.e., prior to any act of choice that establishes a right) in a possession of land that is in conformity with right, that is, they have a right to be wherever nature or chance (apart from their will) has placed them.”[41](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn41) Given the finitude of the earth’s surface, the occupation of space carries with it the possibility of persons coming into contact with one another.[42](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn42) Such contacts are governed by the universal principle of Right. Because no one can interfere with the body of anyone else, a person who occupies a particular space excludes all other persons from that space. In this phase, where one’s only right is the innate right of humanity in one’s own person, property as the entitlement to something distinct from the person’s body does not exist. Of course, a person may come into physical possession of some external object. I might (to use Kant’s examples)[43](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn43) hold an apple or lie on the earth. But someone who wrested the apple away from me or pushed me off the land on which I was lying would be wronging me with respect to my body, not my property. By disturbing the disposition of my fingers as they grasped the apple or of my physical frame as it rested on the earth, the wrongdoer would be acting inconsistently with my innate right to occupy a particular space, rather than infringing a right that I have in the apple or in the resting place as such. The interference would be with what is internally, not externally, mine. Property goes beyond innate right by treating the person as entitled to an external thing even when it is not in the person’s physical possession. Innate right prohibits another’s interference with an external thing only insofar as such interference would simultaneously be an interference with my body as something internally mine. Property, in contrast, entails treating the thing as externally mine, so that the apple I was holding remains mine even when I set it down, and similarly the land upon which I was lying remains mine even when I have moved elsewhere. Under a property regime anyone who interferes with what is mine wrongs me despite the fact that my body is not immediately affected. The extension of the scope of rights to include what is externally mine is the second phase of Kant’s account of property. Kant introduces what he calls “the postulate of practical reason with regard to rights,” under which “it is possible to have any external object of my choice as mine.”[44](https://lawexplores.com/poverty-and-property-in-kants-system-of-rights/ch08_footnote.html#ch08fn44)

#### 2] Universality means every agent has the right to set and pursue their own ends to achieve happiness – property is that good that private entities want

## 2

#### Text – Private Appropriation of Outer Space except for Space Elevators is Unjust.

#### Space Elevators constitute Appropriation – they impede orbits.

Matignon 19 Louis de Gouyon Matignon 3-3-2019 "LEGAL ASPECTS OF THE SPACE ELEVATOR TRANSPORTATION SYSTEM" <https://www.spacelegalissues.com/space-law-legal-aspects-of-the-space-elevator-transportation-system/> [PhD in space law (co-supervised by both Philippe Delebecque, from Université Paris 1 Panthéon-Sorbonne, France, and Christopher D. Johnson, from Georgetown University || regularly write articles on the website Space Legal Issues so as to popularise space law and public international law]//Elmer

An Earth-based space elevator would consist of a cable with one end attached to the surface near the equator and the other end in space beyond geostationary orbit. An orbit is the curved path through which objects in space move around a planet or a star. The 1967 Treaty’s regime and customary law enshrine the principle of non-appropriation and freedom of access to orbital positions. Space Law and International Telecommunication Laws combined to protect this use against any interference. The majority of space-launched objects are satellites that are launched in Earth’s orbit (a very small part of space objects – scientific objects for space exploration – are launched into outer space beyond terrestrial orbits). It is important to precise that an orbit does not exist: satellites describe orbits by obeying the general laws of universal attraction. Depending on the launching techniques and parameters, the orbital trajectory of a satellite may vary. Sun-synchronous satellites fly over a given location constantly at the same time in local civil time: they are used for remote sensing, meteorology or the study of the atmosphere. Geostationary satellites are placed in a very high orbit; they give an impression of immobility because they remain permanently at the same vertical point of a terrestrial point (they are mainly used for telecommunications and television broadcasting). A geocentric orbit or Earth orbit involves any object orbiting Planet Earth, such as the Moon or artificial satellites. Geocentric (having the Earth as its centre) orbits are organised as follow: 1) Low Earth orbit (LEO): geocentric orbits with altitudes (the height of an object above the average surface of the Earth’s oceans) from 100 to 2 000 kilometres. Satellites in LEO have a small momentary field of view, only able to observe and communicate with a fraction of the Earth at a time, meaning a network or constellation of satellites is required in order to provide continuous coverage. Satellites in lower regions of LEO also suffer from fast orbital decay (in orbital mechanics, decay is a gradual decrease of the distance between two orbiting bodies at their closest approach, the periapsis, over many orbital periods), requiring either periodic reboosting to maintain a stable orbit, or launching replacement satellites when old ones re-enter. 2) Medium Earth orbit (MEO), also known as an intermediate circular orbit: geocentric orbits ranging in altitude from 2 000 kilometres to just below geosynchronous orbit at 35 786 kilometres. The most common use for satellites in this region is for navigation, communication, and geodetic/space environment science. The most common altitude is approximately 20 000 kilometres which yields an orbital period of twelve hours. 3) Geosynchronous orbit (GSO) and geostationary orbit (GEO) are orbits around Earth at an altitude of 35 786 kilometres matching Earth’s sidereal rotation period. All geosynchronous and geostationary orbits have a semi-major axis of 42 164 kilometres. A geostationary orbit stays exactly above the equator, whereas a geosynchronous orbit may swing north and south to cover more of the Earth’s surface. Communications satellites and weather satellites are often placed in geostationary orbits, so that the satellite antennae (located on Earth) that communicate with them do not have to rotate to track them, but can be pointed permanently at the position in the sky where the satellites are located. 4) High Earth orbit: geocentric orbits above the altitude of 35 786 kilometres. The competing forces of gravity, which is stronger at the lower end, and the outward/upward centrifugal force, which is stronger at the upper end, would result in the cable being held up, under tension, and stationary over a single position on Earth. With the tether deployed, climbers could repeatedly climb the tether to space by mechanical means, releasing their cargo to orbit. Climbers could also descend the tether to return cargo to the surface from orbit.

#### Private Companies are pursuing Space Elevators.

Alfano 15 Andrea Alfano 8-18-2015 “All Of These Companies Are Working On A Space Elevator” <https://www.techtimes.com/articles/77612/20150818/companies-working-space-elevator.htm> (Writer at the Tech Times)//Elmer

Space elevators are solid proof that any mundane object sounds way cooler if you stick the word "space" in front of it. But there's much more than coolness at stake when building a space elevator – this technology has the potential to revolutionize space transportation, and the Canadian private space company Thoth Technology that was recently awarded a patent for its space elevator design isn't the only company in the game. One of the other major players is a U.S.-based company called LiftPort Group, founded by space entrepreneur Michael Laine in 2003. Its plan for a space elevator is vastly different from the one for which Thoth received a patent, however. Whereas Thoth's plans entail tethering a 12-mile-high inflatable space elevator to the Earth, LiftPort is shooting for the moon. Originally, LiftPort had planned to build an Earth elevator, too, but it abandoned the idea in 2007 in favor of building a lunar elevator. The basic design for a lunar elevator is an anchor in the moon that is attached to a cable that extends to a space station situated at a very special point. Known as a Lagrange Point, this is the gravitational tipping point between the Earth and the moon, where their gravitational pulls essentially cancel one another out. A robot could then travel up and down the tether, ferrying cargo between the moon and the station. Out farther in space, a counterweight would balance out the system. Both types of space elevator are intended to increase space access, but in very different ways. Thoth's Earth elevator aims to make launches easier by starting off 12 miles above the Earth's surface. LiftPort's space elevator aims to increase access to the moon in particular, because it is much easier to launch a rocket to the Lagrange Point and dock it at a space station than it is to get to the moon directly. There's a third major company based in Japan called Obayashi Corp. whose plans look like a hybrid of Thoth's and LiftPort's. Obayashi is not a space company, however – it's actually a construction company. Like Thoth, Obayashi plans to build an Earth elevator. But its Earth elevator would consist of a cable tethered to the blue planet, a robotic cargo-carrier, a space station, and a counterweight. It essentially looks like LiftPort's plans, but stuck to the Earth instead of to the moon.

#### They’re feasible.

Smith 17 Vincent Smith 6-21-2017 "3 Challenges for Engineering A Space Elevator" <https://www.engineering.com/story/3-challenges-for-engineering-a-space-elevator> (Engineer)//Elmer

There's a lot of junk orbiting Earth. Thousands of hours have been poured into previous NASA missions, ensuring the least possible contamination by even the tiniest motes of dust and dirt. The kinds of instrumentation that would monitor a space elevator would need to be similarly discerning. However, the fact that it would be a permanent fixture means that sooner or later, a space elevator would cross paths with meteors and even remnants of previous space missions left behind as space debris. The extreme of this phenomenon even has a name: Kessler Syndrome, where the density of low earth debris becomes so large that nothing can pass it safely into outer space. This cascading problem of space debris collisions was featured in the film Gravity. As Bullock and Clooney can tell you, this phenomenon could cause catastrophic damage to the overall structure (or knock it off balance, returning to our 'oscillation' concerns). Edwards recognized this, and devoted an entire section of his report to addressing it. According to the report, part of dealing with this obstacle is recognizing and tracking low-earth orbit objects large enough to do damage to the structure. According to Section 10.3 of the report, “A study was done at Johnson Space Center on the construction of a system that could track objects down to 1cm in size with 100m accuracy using effectively current technology. This is very close to the tracking network we would need for the space elevator.” For situations in which avoidance is not always possible (the amount of low-earth orbit debris increases significantly from altitudes of approximately 300 to 1,000 miles), Edwards posits that increasing the thickness of the cable will make it robust enough to withstand all but the largest of objects, which could be tracked and avoided ahead of time using the systems previously mentioned. Even for these exceptional pieces of debris, Edwards illustrates in a section simply labeled “Meteors” that only (i) direct impact by an object (ii) over 3cm in diameter, (iii) with enough force to stay on the initial plane of impact (as opposed to being deflected or redirected by contact with the elevator apparatus), would create the kind of catastrophic damage that we associate with a complete severing of the cable. Designing the cable with curvature and panels specifically for deflection has been proposed by both Edwards as well as several other survivability reports, including this one, put together for the 2010 International Space Elevator Consortium (ISEC). Definitive answers as to the effectiveness of these measures are hopefully forthcoming, but it's at least comforting to know that there are first, second, and third lines of defense prepared for just such occasions.

#### Regardless of completion, Elevators spur investment in Nanotechnology

Liam O’Brien 16. University of Wollongong. 07/2016. “Nanotechnology in Space.” Young Scientists Journal; Canterbury, no. 19, p. 22.

Nanotechnology is at the forefront of scientific development, continuing to astound and innovate. Likewise, the space industry is rapidly increasing in sophistication and competition, with companies such as SpaceX, Blue Origin and Virgin Galactic becoming increasingly prevalent in what could become a new commercial space race. The various space programs over the past 60 years have led to a multitude of beneficial impacts for everyday society. Nanotechnology, through research and development in space has the potential to do the same. Potential applications of nanotechnology in space are numerous, many of them have the potential to capture and inspire generations to come. One of these applications is the space elevator. By using carbon nanotubes, a super light yet strong material, this concept would be an actual physical structure from the surface of the Earth to an altitude of approximately 36 000 km. The tallest building in the world would fit into this elevator over 42 000 times. The counterweight, used to keep the elevator taught, is proposed to be an asteroid. This would need to be at a distance of 100 000 km, a quarter of the distance to the moon. The benefits of such a structure would be enormous. 95% of a space shuttle's weight at take-off is fuel, costing US$ 20 000 per kilogram to send something into space. However, with a space elevator the cost per kilogram can be reduced to as little as US$ 200. Exploration to other planets can begin at the tower, and travel to and from the moon could become as simple as a morning commute to work. Solar sails provide the means to travel large distances and incredible speeds. Much like sails on a boat use wind, the solar sail uses light as a source of propulsion. Ideally these sails would be kilometres in length and only a few micrometres in thickness. This provides us with the ability to travel at speeds previously unheard of. Using carbon nanotubes once again, a solar sail has the capability to travel at 39 756 km/s which is 13% of the speed of light! This sail could reach Pluto in an astonishing 1.7 days, and Alpha Centauri in just 32 years. Space travel to other planets, other stars, could be possible with solar sails. The Planetary Society is funding for a space sail of itself, and has successfully launched one into orbit. NASA has also sent a sail into orbit, allowing it to burn up in the atmosphere after 240 days. Investing time and resources into nanotechnology for space exploration has benefits for society today. Materials such as graphene are being used in modern manufacturing at an increasing rate as the applications become utilised. Carbon nanotubes will change the way we think about materials and their strength. These nanotubes have a tensile strength one hundred times that of steel, yet are only a sixth of the weight. Imagine light weight vehicles using less petrol and energy as well as being just as strong as regular vehicles. With potentials to revolutionize the way we think about space travel, nanotechnology has a bright future. As a new field of science, it has the capability to push the human race to the outer reaches of our galaxy and hopefully one day to other stars. It will inspire generations of explorers and dreamers to challenge themselves and advance the human race into the next era. As Richard Feynman said in his 1959 talk 'There's Plenty of Room at the Bottom' "A field in which little has been done, but in which an enormous amount can be done. There is still plenty more to achieve.

#### Nanomaterials solve Warming and Water Scarcity.

Khullar 17 Bhavya Khullar 9-4-2017 "Nanomaterials Could Combat Climate Change and Reduce Pollution" <https://www.scientificamerican.com/article/nanomaterials-could-combat-climate-change-and-reduce-pollution/> (Former Programme Officer with the Food Safety and Toxins Unit, Centre for Science and Environment (CSE))//Elmer

August 18, 2017 — The list of environmental problems that the world faces may be huge, but some strategies for solving them are remarkably small. First explored for applications in microscopy and computing, nanomaterials—materials made up of units that are each thousands of times smaller than the thickness of a human hair—are emerging as useful for tackling threats to our planet’s well-being. Scientists across the globe are developing nanomaterials that can efficiently use carbon dioxide from the air, capture toxic pollutants from water and degrade solid waste into useful products. “Nanomaterials could help us mitigate pollution. They are efficient catalysts and mostly recyclable. Now, they have to become economical for commercialization and better to replace present-day technologies completely,” says Arun Chattopadhyay, a member of the chemistry faculty at the Center for Nanotechnology, Indian Institute of Technology Guwahati. HARVESTING CO2 To help slow the climate-changing rise in atmospheric CO2levels, researchers have developed nanoCO2 harvesters that can suck atmospheric carbon dioxide and deploy it for industrial purposes. “Nanomaterials can convert carbon dioxide into useful products like alcohol. The materials could be simple chemical catalysts or photochemical in nature that work in the presence of sunlight,” says Chattopadhyay, who has been working with nanomaterials to tackle environmental pollutants for more than a decade. Many research groups are working to address a problem that, if solved, could be a holy grail in combating climate change: how to pull CO2 out of the atmosphere and convert it into useful products. Chattopadhyay isn’t alone. Many research groups are working to address a problem that, if solved, could be a holy grail in combating climate change: how to pull CO2 out of the atmosphere and convert it into useful products. Nanoparticles offer a promising approach to this because they have a large surface-area-to-volume ratio for interacting with CO2 and properties that allow them to facilitate the conversion of CO2into other things. The challenge is to make them economically viable. Researchers have tried everything from metallic to carbon-based nanoparticles to reduce the cost, but so far they haven’t become efficient enough for industrial-scale application. One of the most recent points of progress in this area is work by scientists at the CSIR-Indian Institute of Petroleum and the Lille University of Science and Technology in France. The researchers developed a nanoCO2 harvester that uses water and sunlight to convert atmospheric CO2 into methanol, which can be employed as an engine fuel, a solvent, an antifreeze agent and a diluent of ethanol. Made by wrapping a layer of modified graphene oxide around spheres of copper zinc oxide and magnetite, the material looks like a miniature golf ball, captures CO2 more efficiently than conventional catalysts and can be readily reused, according to Suman Jain, senior scientist of the Indian Institute of Petroleum, Dehradun in India, who developed the nanoCO2harvester. Jain says that the nanoCO2 harvester has a large molecular surface area and captures more CO2 than a conventional catalyst with similar surface area would, which makes the conversion more efficient. But due to their small size, the nanoparticles have a tendency to clump up, making them inactive with prolonged use. Jain adds that synthesizing useful nanoparticle-based materials is also challenging because it’s hard to make the particles a consistent size. Chattopadhyay says the efficiency of such materials can be improved further, providing hope for useful application in the future. CLEANSING WATER Most toxic dyes used in textile and leather industries can be captured with nanoparticles. “Water pollutants such as dyes from human-created waste like those from tanneries could get to natural sources of water like deep tube wells or groundwater if wastewater from these industries is left untreated,” says Chattopadhyay. “This problem is rather difficult to solve.” An international group of researchers led by professor Elzbieta Megiel of the University of Warsaw in Poland reports that nanomaterials have been widely studied for removing heavy metals and dyes from wastewater. According to the research team, adsorption processes using materials containing magnetic nanoparticles are highly effective and can be easily performed because such nanoparticles have a large number of sites on their surface that can capture pollutants and don’t readily degrade in water. Chattopadhyay adds that appropriately designed magnetic nanomaterials can be used to separate pollutants such as arsenic, lead, chromium and mercury from water. However, the nanotech-based approach has to be more efficient than conventional water purification technology to make it worthwhile. In addition to removing dyes and metals, nanomaterials can also be used to clean up oil spills. Researchers led by Pulickel Ajayan at Rice University in Houston, Texas, have developed a reusable nanosponge that can remove oil from contaminated seawater. The technology shows promise, but it’s not yet ready for prime time. “While the nanosponge is a good material to deal with oil spills, these results are confined to the laboratory,” says Ashok Ganguli, director of the Institute of Nano Science and Technology in Mohali, Punjab, India. “Large-scale synthesis is required if we have to remove oil from seawater which is spread over several miles.” Although scientists have yet to successfully synthesize nanomaterials for cleaning oil spills at a scale large enough for practical application, “this may become possible with more research and industry partnerships,” Chattopadhyay says.

#### Warming causes Extinction

Kareiva 18, Peter, and Valerie Carranza. "Existential risk due to ecosystem collapse: Nature strikes back." Futures 102 (2018): 39-50. (Ph.D. in ecology and applied mathematics from Cornell University, director of the Institute of the Environment and Sustainability at UCLA, Pritzker Distinguished Professor in Environment & Sustainability at UCLA)//Re-cut by Elmer

In summary, six of the nine proposed planetary boundaries (phosphorous, nitrogen, biodiversity, land use, atmospheric aerosol loading, and chemical pollution) are unlikely to be associated with existential risks. They all correspond to a degraded environment, but in our assessment do not represent existential risks. However, the three remaining boundaries (**climate change**, global **freshwater** cycle, **and** ocean **acidification**) do **pose existential risks**. This is **because of** intrinsic **positive feedback loops**, substantial lag times between system change and experiencing the consequences of that change, and the fact these different boundaries interact with one another in ways that yield surprises. In addition, climate, freshwater, and ocean acidification are all **directly connected to** the provision of **food and water**, and **shortages** of food and water can **create conflict** and social unrest. Climate change has a long history of disrupting civilizations and sometimes precipitating the collapse of cultures or mass emigrations (McMichael, 2017). For example, the 12th century drought in the North American Southwest is held responsible for the collapse of the Anasazi pueblo culture. More recently, the infamous potato famine of 1846–1849 and the large migration of Irish to the U.S. can be traced to a combination of factors, one of which was climate. Specifically, 1846 was an unusually warm and moist year in Ireland, providing the climatic conditions favorable to the fungus that caused the potato blight. As is so often the case, poor government had a role as well—as the British government forbade the import of grains from outside Britain (imports that could have helped to redress the ravaged potato yields). Climate change intersects with freshwater resources because it is expected to exacerbate drought and water scarcity, as well as flooding. Climate change can even impair water quality because it is associated with heavy rains that overwhelm sewage treatment facilities, or because it results in higher concentrations of pollutants in groundwater as a result of enhanced evaporation and reduced groundwater recharge. **Ample clean water** is not a luxury—it **is essential for human survival**. Consequently, cities, regions and nations that lack clean freshwater are vulnerable to social disruption and disease. Finally, ocean acidification is linked to climate change because it is driven by CO2 emissions just as global warming is. With close to 20% of the world’s protein coming from oceans (FAO, 2016), the potential for severe impacts due to acidification is obvious. Less obvious, but perhaps more insidious, is the interaction between climate change and the loss of oyster and coral reefs due to acidification. Acidification is known to interfere with oyster reef building and coral reefs. Climate change also increases storm frequency and severity. Coral reefs and oyster reefs provide protection from storm surge because they reduce wave energy (Spalding et al., 2014). If these reefs are lost due to acidification at the same time as storms become more severe and sea level rises, coastal communities will be exposed to unprecedented storm surge—and may be ravaged by recurrent storms. A key feature of the risk associated with climate change is that mean annual temperature and mean annual rainfall are not the variables of interest. Rather it is extreme episodic events that place nations and entire regions of the world at risk. These extreme events are by definition “rare” (once every hundred years), and changes in their likelihood are challenging to detect because of their rarity, but are exactly the manifestations of climate change that we must get better at anticipating (Diffenbaugh et al., 2017). Society will have a hard time responding to shorter intervals between rare extreme events because in the lifespan of an individual human, a person might experience as few as two or three extreme events. How likely is it that you would notice a change in the interval between events that are separated by decades, especially given that the interval is not regular but varies stochastically? A concrete example of this dilemma can be found in the past and expected future changes in storm-related flooding of New York City. The highly disruptive flooding of New York City associated with Hurricane Sandy represented a flood height that occurred once every 500 years in the 18th century, and that occurs now once every 25 years, but is expected to occur once every 5 years by 2050 (Garner et al., 2017). This change in frequency of extreme floods has profound implications for the measures New York City should take to protect its infrastructure and its population, yet because of the stochastic nature of such events, this shift in flood frequency is an elevated risk that will go unnoticed by most people. 4. The combination of positive feedback loops and societal inertia is fertile ground for global environmental catastrophes **Humans** are remarkably ingenious, and **have adapted** to crises **throughout** their **history**. Our doom has been repeatedly predicted, only to be averted by innovation (Ridley, 2011). **However**, the many **stories** **of** human ingenuity **successfully** **addressing** **existential risks** such as global famine or extreme air pollution **represent** environmental c**hallenges that are** largely **linear**, have immediate consequences, **and operate without positive feedbacks**. For example, the fact that food is in short supply does not increase the rate at which humans consume food—thereby increasing the shortage. Similarly, massive air pollution episodes such as the London fog of 1952 that killed 12,000 people did not make future air pollution events more likely. In fact it was just the opposite—the London fog sent such a clear message that Britain quickly enacted pollution control measures (Stradling, 2016). Food shortages, air pollution, water pollution, etc. send immediate signals to society of harm, which then trigger a negative feedback of society seeking to reduce the harm. In contrast, today’s great environmental crisis of climate change may cause some harm but there are generally long time delays between rising CO2 concentrations and damage to humans. The consequence of these delays are an absence of urgency; thus although 70% of Americans believe global warming is happening, only 40% think it will harm them (http://climatecommunication.yale.edu/visualizations-data/ycom-us-2016/). Secondly, unlike past environmental challenges, **the Earth’s climate system is rife with positive feedback loops**. In particular, as CO2 increases and the climate warms, that **very warming can cause more CO2 release** which further increases global warming, and then more CO2, and so on. Table 2 summarizes the best documented positive feedback loops for the Earth’s climate system. These feedbacks can be neatly categorized into carbon cycle, biogeochemical, biogeophysical, cloud, ice-albedo, and water vapor feedbacks. As important as it is to understand these feedbacks individually, it is even more essential to study the interactive nature of these feedbacks. Modeling studies show that when interactions among feedback loops are included, uncertainty increases dramatically and there is a heightened potential for perturbations to be magnified (e.g., Cox, Betts, Jones, Spall, & Totterdell, 2000; Hajima, Tachiiri, Ito, & Kawamiya, 2014; Knutti & Rugenstein, 2015; Rosenfeld, Sherwood, Wood, & Donner, 2014). This produces a wide range of future scenarios. Positive feedbacks in the carbon cycle involves the enhancement of future carbon contributions to the atmosphere due to some initial increase in atmospheric CO2. This happens because as CO2 accumulates, it reduces the efficiency in which oceans and terrestrial ecosystems sequester carbon, which in return feeds back to exacerbate climate change (Friedlingstein et al., 2001). Warming can also increase the rate at which organic matter decays and carbon is released into the atmosphere, thereby causing more warming (Melillo et al., 2017). Increases in food shortages and lack of water is also of major concern when biogeophysical feedback mechanisms perpetuate drought conditions. The underlying mechanism here is that losses in vegetation increases the surface albedo, which suppresses rainfall, and thus enhances future vegetation loss and more suppression of rainfall—thereby initiating or prolonging a drought (Chamey, Stone, & Quirk, 1975). To top it off, overgrazing depletes the soil, leading to augmented vegetation loss (Anderies, Janssen, & Walker, 2002). Climate change often also increases the risk of forest fires, as a result of higher temperatures and persistent drought conditions. The expectation is that **forest fires will become more frequent** and severe with climate warming and drought (Scholze, Knorr, Arnell, & Prentice, 2006), a trend for which we have already seen evidence (Allen et al., 2010). Tragically, the increased severity and risk of Southern California wildfires recently predicted by climate scientists (Jin et al., 2015), was realized in December 2017, with the largest fire in the history of California (the “Thomas fire” that burned 282,000 acres, https://www.vox.com/2017/12/27/16822180/thomas-fire-california-largest-wildfire). This **catastrophic fire** embodies the sorts of positive feedbacks and interacting factors that **could catch humanity off-guard and produce a** true **apocalyptic event.** Record-breaking rains produced an extraordinary flush of new vegetation, that then dried out as record heat waves and dry conditions took hold, coupled with stronger than normal winds, and ignition. Of course the record-fire released CO2 into the atmosphere, thereby contributing to future warming. Out of all types of feedbacks, water vapor and the ice-albedo feedbacks are the most clearly understood mechanisms. Losses in reflective snow and ice cover drive up surface temperatures, leading to even more melting of snow and ice cover—this is known as the ice-albedo feedback (Curry, Schramm, & Ebert, 1995). As snow and ice continue to melt at a more rapid pace, millions of people may be displaced by flooding risks as a consequence of sea level rise near coastal communities (Biermann & Boas, 2010; Myers, 2002; Nicholls et al., 2011). The water vapor feedback operates when warmer atmospheric conditions strengthen the saturation vapor pressure, which creates a warming effect given water vapor’s strong greenhouse gas properties (Manabe & Wetherald, 1967). Global warming tends to increase cloud formation because warmer temperatures lead to more evaporation of water into the atmosphere, and warmer temperature also allows the atmosphere to hold more water. The key question is whether this increase in clouds associated with global warming will result in a positive feedback loop (more warming) or a negative feedback loop (less warming). For decades, scientists have sought to answer this question and understand the net role clouds play in future climate projections (Schneider et al., 2017). Clouds are complex because they both have a cooling (reflecting incoming solar radiation) and warming (absorbing incoming solar radiation) effect (Lashof, DeAngelo, Saleska, & Harte, 1997). The type of cloud, altitude, and optical properties combine to determine how these countervailing effects balance out. Although still under debate, it appears that in most circumstances the cloud feedback is likely positive (Boucher et al., 2013). For example, models and observations show that increasing greenhouse gas concentrations reduces the low-level cloud fraction in the Northeast Pacific at decadal time scales. This then has a positive feedback effect and enhances climate warming since less solar radiation is reflected by the atmosphere (Clement, Burgman, & Norris, 2009). The key lesson from the long list of potentially positive feedbacks and their interactions is that **runaway climate change,** and runaway perturbations have to be taken as a serious possibility. Table 2 is just a snapshot of the type of feedbacks that have been identified (see Supplementary material for a more thorough explanation of positive feedback loops). However, this list is not exhaustive and the possibility of undiscovered positive feedbacks **portends** even greater **existential risks**. The many environmental crises humankind has previously averted (famine, ozone depletion, London fog, water pollution, etc.) were averted because of political will based on solid scientific understanding. We cannot count on complete scientific understanding when it comes to positive feedback loops and climate change.

## 3

#### Extinction outweighs---it’s the upmost moral evil and disavowal of the risk makes it more likely.

#### 1] Right to life matters

#### 2] Non universalizable for mass extinction, that’s a contradiction in conception

#### 3] Right to freedom to set and pursue ends begins with life so we are a lexical pre requisite.

#### TJFs first,

#### A] substance begs the question of a framework being good for debate, which procedurally outweighs

#### 1] Prep – small school debaters need a few good generics like heg, innovation, and few advantage counteplans to engage, but under \_\_\_, contentions are less variable and analytics are more important, big-school block-writing hoses them every round. Blocks don’t matter nearly as much for util since innovation checks coaching bias.

#### 2] Innovation – space topic has more util offense than kant – large swaths of literature proves. Proves util incentivizes a wider variety of arguments than kant, which causes recycling of old args – the same kant justifications have been read every phil round for decades. New advantages are broken often, but phil contentions never change for two months after being read

#### 3] Ground – non-util concludes overwhelmingly on one side– for example, Kant on the objectivity topic would auto affirm because lying creates contradictions in conception, so all debaters are either presumption or aff ballots on substance. Only util generates robust debates with equitable ground.

#### 4] Real-world – abstract debates about philosophy have much less grounding than util – discussing consequences gives students education about fopo, economics, IR, etc. Outweighs since portable skills are the ultimate goal of debate.

## Case

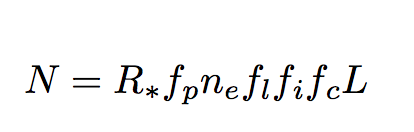
### AT Green

#### The newest study errs negative — the Drake Equation assumes the latest science and most likely scenarios

— we don’t endorse ableist language

Coren 18 — Michael J. Coren (covers technology, science, startups, and VC), 6-25-2018, “Where is Everybody — We may have answered the Fermi Paradox: We are alone in the universe,” <https://qz.com/1314111/we-may-have-answered-the-fermi-paradox-we-are-alone-in-the-universe/>, [accessed: 5/18/19] — JPark

Researchers of Oxford University’s Future of Humanity Institute have another answer. It’s likely intelligent life doesn’t exist at all, outside of Earth. In a paper submitted to the Proceedings of the Royal Society of London (it appeared online this month on the pre-publication site arXiv), the researchers write that there is “a substantial ex ante probability of there being no other intelligent life in our observable universe,” and we shouldn’t be surprised if we fail to detect any signs of it. In other words, there is no need to speculate about the fate of aliens. It’s likely they’ve never existed, they assert in the paper, titled “Dissolving the Fermi Paradox.” The Fermi Paradox derives from a question reportedly posed by physicist Enrico Fermi during a 1950 lunch in the Los Alamos National Laboratory in the state of New Mexico. According to Scientific American, a group of scientists were discussing a New Yorker cartoon showing aliens emerging a spaceship, onto the streets of New York City. ”Where is everyone?” Fermi asked. While he was likely questioning the possibility of interstellar travel, later accounts suggested he was casting doubt on the existence of extraterrestrials themselves, the magazine reports. Scientists have been trying to answer Fermi’s question ever since. Many of the most rigorous attempts have built on a postulation known as the Drake equation. There are plenty of unknowns, but the equation suggests it’s plausible thousands of detectable alien civilizations could be roaming the Milky Way based on the probability of seven factors. The equation:



N: total detectable alien civilizations in the Milky Way

R∗: rate of star formation per year

fp: fraction of stars with planets

ne: Earth-like (or otherwise habitable) planets per system with planets

fl: fraction of such planets with life

fi: fraction with life that develop intelligence

fc: fraction of intelligent civilizations that are detectable/contactable

L: average longevity of such detectable civilizations

Previous estimates of the Drake equation have assigned a single number to those variables. The recent study sought to make a more informed guess. It relies on our latest knowledge of biology, chemistry, and cosmology, and uses a distribution of probabilities (a range) to capture the most likely scenarios, rather than assign a single value. When they did, the researchers found that the possibility we’re alone in the galaxy is far higher than presumed given the truly gargantuan number of possible home planets. The authors assert that the chance humanity stands alone among intelligent civilizations in our galaxy is 53%–99.6%, and across the observable universe is 39%–85%. Since the Fermi “paradox” exists only if we are confident alien civilizations are out there, this uncertainty suggests we may just be the lucky ones—thus, there is no such paradox. ”We should not actually be all that surprised to see an empty galaxy,” the authors write. But don’t give up entirely. The Drake equation, at best, merely gives us a way to formalize what is still unknowable. It’s a big universe.

#### No aliens – probes

Forgan 19 [Duncan Forgan, researcher in the School of Physics & Astronomy at the University of St Andrews.] “Predator-Prey Behaviour in Self-Replicating Interstellar Probes” 2 March 2019 (<https://arxiv.org/abs/1903.00770>) – MZhu

Why have we detected no sign of intelligent life beyond the Earth? This fundamental question continues to challenge our deepest-held beliefs about humanity and our place in the Universe. Fermi’s Paradox forces us to confront our Copernican assumptions about our lack of uniqueness with the lack of extraterrestrial intelligences (ETIs, see e.g. Brin, 1983; Cirkovi ´ c, 2009). Its strongest formulation can be given as follows ´ (Tipler, 1980). Imagine a civilisation constructs an interstellar probe that is self-replicating. Such a probe would be able to produce a copy every time it visits a new star system. As each copy makes copies, the number of self-replicating probes (SRPs) grows exponentially, and every star in the Milky Way is explored on a timescale much, much shorter than its age. Estimates for this exploration timescale vary, but are as short as ten million years (Nicholson & Forgan, 2013), and perhaps shorter still. Given that this timescale is much shorter than the age of the Earth, and only one ETI constructing SRPs is sufficient to produce this scenario, on balance we should expect to see an interstellar probe orbiting the Sun. And yet, we do not. How can this be resolved? Among many possibilities, we can include solutions that require civilisations to be rare. However, as a single civilisation is sufficient to swamp the galaxy in SRPs, we are effectively asking for humanity to be alone in the Universe.

#### Extremely unlikely that aliens exist

#### A] First contact would be made

#### B] They would be considered moral patients instead of agents

#### C] Our universalized worlds could not cohere a conception of aliens or their thought

#### process, so we don’t know whether they are bound by reason and rational will

### AT Cordelli

#### Cordelli is wrong- justifies private agents never taking decisions or actions which contradicts the entire 1AC FW- privatization is good because people have the right to engage in their own decisions the 1AC violates their freedom- also their tag is not what the card justifies, deliberation has no impact under your fw

### AT Universality Test

#### A is consequentialist and not true- people would stay to be mission control B that would mean every agent is immoral, because not everyone can universally be an Indian male C the concept of space exploration requires space to exist, which concedes the validity of earth and humans existing D, pic turns this argument because warming and extinction kill everyone

### AT Space Property Rights

#### A is wrong, its a definition of space not outer space which includes celestial bodies

#### B was answered above since aliens don’t exist