### Experts CP

#### Text: The justice of appropriation of outer space by private enterprise ought to be determined by a panel of subject matter experts

#### It’s modeled after the Antarctic Treaty

Kerrest 11

Armel Kerrest (Head of the public law department of the University of Western Brittany; Chairman of the Institute of Law of International Spaces and Telecommunications). "Outer Space as International Space: Lessons from Antarctica." in Science Diplomacy: Antarctica, Science, and the Governance of International Spaces, edited by Berkman, Paul Arthur, Lang, Michael A., Walton, David W. H., and Young, Oran R., 133–142. Smithsonian Contributions to Knowledge. 2011. JDN. https://doi.org/10.5479/si.9781935623069.133

The current status of Antarctica is generally **well accepted**; efficient cooperation is occurring. In outer space it should be quite useful to try, mutatis mutandis, to use the lessons from the Antarctic Treaty System. First, **world scientists should be given a more important role** when issues are not too strategic; groups of experts within the framework of the United Nations could be created in related scientific areas, including **space law**. They should range from particular domains, like planetary protection, to more general uses, including mitigation of space debris, space traffic management, and even limitation of military uses.

#### The Antarctic model proves expert input is key and should be unconstrained by politics

Chown 21

Steven L. Chown (Professor, School of Biological Sciences, Monash University, Australia; Director, Securing Antarctica's Environmental Future). “The future role of the Scientific Committee on Antarctic Research.” Antarctic Science, Volume 33, Issue 4, August 2021, pp. 333 – 334. JDN. https://www.cambridge.org/core/journals/antarctic-science/article/future-role-of-the-scientific-committee-on-antarctic-research/094B62FFFF33280477AFE75CEFAD7492

The Scientific Committee on Antarctic Research (SCAR) is now more than 60 years old and about to embark on the development of a new Strategic Plan. The immediate question, therefore, is what path should SCAR follow?

SCAR has long had two major roles. The first is science coordination. SCAR initiates and facilitates research in, from and about Antarctica and the Southern Ocean, particularly research concerned with the role of the region in the changing Earth System. The second is the provision of evidence-based **scientific advice** to decision-makers in the Antarctic Treaty System (ATS) and to those in other bodies such as those of the United Nations. Here, SCAR is in a unique position.

SCAR is the only observer to the Antarctic Treaty Consultative Meetings specifically mentioned in the Protocol on Environmental Protection to the Antarctic Treaty (Article 10(2)) as a provider of independent advice to the Antarctic Treaty Consultative Parties (ATCPs). In this role, SCAR is widely appreciated. At their 42nd meeting, through Resolution 7 (2019) the ATCPs acknowledged ‘… with gratitude SCAR's enduring and crucial role in providing objective and independent scientific advice to support and inform the work of the ATCM [Antarctic Treaty Consultative Meeting] and the CEP [Committee on Environmental Protection] …’. SCAR is also an affiliated body of the International Science Council and makes substantive contributions elsewhere such as by facilitating inputs and contributing to the reports of the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

SCAR's advice can thus readily be provided to the ATS and to other bodies in ways **not constrained by** the jurisdictions of **international agreements.** In other words, the 60°S limit of the Antarctic Treaty and the Antarctic Convergence limit of the Convention on the Conservation of Antarctic Marine Living Resources place no restrictions on SCAR's science or the advice it provides. The Earth System does not recognize political boundaries, and nor should research and scientific advice about it. Not only do SCAR's founding documents make clear that its research includes the sub-Antarctic, but SCAR-facilitated research has long recognized the significance of global teleconnections. Antarctica and the Southern Ocean are integral parts of the Earth System.

In the context of SCAR's forthcoming Strategic Plan, these two major roles - science facilitation and advice - should, of course, remain foundational. Yet SCAR's three new Scientific Research Programmes (SRPs) should take centre stage because of their international significance. These new SRPs focus on 1) ice-sheet instabilities, thresholds and sea-level rise (INSTANT), 2) short-term (1–30 years) variability in climate (AntClimnow) and 3) patterns and processes in and the conservation of marine and terrestrial biodiversity given changes in the region (Ant-ICON).

These SRPs will deliver scientific outcomes that are arguably amongst the most crucial for the future of modern society, that will substantially improve our understanding of climate variability in the region, and that will inform decisions to ensure a favourable future outlook for the extraordinary biodiversity that is a hallmark of the Antarctic and Southern Ocean. Moreover, the SRPs have been purposefully designed such that their outcomes and findings will enable SCAR to continue to grow its highly regarded evidence-based advice to the ATS and to others. The potential societal benefits are considerable at a time when appreciation for the value and benefit of **policy action informed by scientific evidence** has deepened significantly.

That advice must necessarily have a global, Earth System context. Only through globally integrated research and policy decisions that recognize the unity of the Earth System are the future envisaged by the Sustainable Development Goals and one that avoids dangerous climate change likely to be realized. Yet SCAR's research and advice must by necessity also consider the regional context - one that includes a region set aside ‘as a natural reserve, devoted to peace and science’ and the significant aspirations for globally leading conservation that this implies. In addressing these requirements, SCAR's advice must be characterized by clarity of presentation founded on the best available evidence. At times, this may result in some unintended political discomfort. Yet that discomfort will remain far less than what will be coming if the considerable challenges to the Earth System, Southern Ocean and Antarctica, largely as a consequence of climate change, are not avoided because the implications of the scientific evidence have not been made clear.

Therefore, integration of the three new SRPs with the provision of timely, clear and reliable advice to the ATS and a range of other bodies must serve as a core to SCAR's new Strategic Plan. Obviously, SCAR facilitates a diverse portfolio of research through the dedicated work of its members and volunteers - and it should continue to do so. But only through focused, foundational support of its new SRPs and continual growth of its science advice role will SCAR provide the research and policy service most needed now by society. Our lives, and those of the species with which we share the planet, depend on it.

#### The counterplan solves the case better—either their advantages are correct and it will result in the aff, or experts conclude your plan is bad and propose something else in which case we should trust them on it

#### Deference to experts is the only reliable epistemology for modern decision-making

Baurmann 7

Michael Baurmann (Professor at the University of Düsseldorf). “Rational Fundamentalism? An Explanatory Model of Fundamentalist Beliefs.” 2007. Episteme 4 (2):150-166. JDN. <http://www.phil-fak.uni-duesseldorf.de/fileadmin/Redaktion/Institute/Sozialwissenschaften/Soziologie/Dokumente/Baurmann/Rational_Fundamentalism.pdf>

Our knowledge of the world is **largely dependent on testimony**. This is especially true in a modern world with a **high** degree of **division of cognitive labour.** We are, our day and age, not only dependent on testimony but especially on the testimony of experts and specialists whose qualifications and competence **cannot directly be judged by** us as **laypersons** (Hardwig 1985). Nevertheless we routinely believe the testimony of historians, physicists, chemists, meteorologists, doctors, lawyers and (sometimes) sociologists. Furthermore, this is not only true in regard to scientists and academics. We also rely in many cases on the epistemic authority of priests, politicians, opinion-leaders or visionaries in metaphysical, political, moral or ideological matters. This deference to authority seems to be an **unavoidable corollary** of the **ever-increasing** process of **cognitive specialization** and differentiation. We can be experts ourselves only in a very tiny section of the collective knowledge production, most of the time we are laypersons in the majority of fields. One can indeed call it a “paradox of knowledge” that the more we know collectively the less we know as individuals (Weber 1946). Our faith in epistemic authorities and knowledge specialists is often connected with the fact that they are **members of special institutions**: universities, research institutions, scientific labs, hospitals, courts, churches. We may think that these institutions exhibit special features and that their members will have special qualifications and incentives to produce reliable knowledge. But institutions are also important in respect to the general production of information. In developed societies, people get the largest part of their information by all kinds of media, such as books, newspaper, television or the internet. And we rely very heavily on testimony which comes from these sources. Other sources of our knowledge are our fellow citizens who are neither epistemic authorities nor specialists in information production. They are important for trivial everyday information, but sometimes also for very crucial issues. Information from such informal sources can, for example, in some situations shatter our belief that science or the media are really reliable sources of knowledge. A further source is provided by individuals who we know personally, with whom we have ongoing relationships and sometimes intimate contact: parents, friends, teachers, children, spouses, colleagues. In all these contexts the dependence on testimony is a strong dependence in the sense that we are, in most cases, not able to prove the truth of the testimony ourselves. The reason is basically already a resource-problem. We do not have the time and the possibility to prove all information by ourselves – even if we were able to do it in principle. In societies with a significant division of cognitive labour between laypersons and experts we also have a competence problem in many cases. We then cannot prove the truth of information even in principle because for that we must have special expertise.

#### That specifically turns util

Schubert and Caviola 21

Stefan Schubert (The Centre for Philosophy of Natural and Social Science, London School of Economics and Political Science) and Lucius Caviola (Dept. of Psychology, Harvard University). “Virtues for Real-World Utilitarians.” July 2021. JDN. https://psyarxiv.com/w52zm

To identify the most effective altruistic interventions, utilitarians therefore must have an attitude of honest and humble truth-seeking (cf. Schmidt, 2017). But as **a wealth of** psychological **research** has shown, this is not our default epistemic attitude. Instead, human reasoning is plagued by a range of biases. Let us here just cover a few particularly important examples.

One of the most salient epistemic problems is our tendency to engage in motivated reasoning (Kunda, 1992). Instead of impartially evaluating the evidence, we tend to be biased in favor of views that we find politically convenient, or which we like for other reasons (Kahan, 2015). Likewise, there is the ubiquitous confirmation bias: we selectively seek out evidence that supports our views, while neglecting evidence that would falsify them (Oswald and Grosjean, 2004). Relatedly, we tend to be overconfident—to **overestimate our own expertise** relative to others’ (Hoffrage, 2004). As a result, we are often insufficiently inclined to defer to our epistemic peers or superiors. For instance, donors often have little knowledge of what the most effective charities are (Caviola et al. 2020b)—but instead of seeking out experts, who do know, they go with their own guesses. This obviously tends to reduce the effectiveness of their donations.

We are also, to varying degrees, cognitive misers—we do not seek out evidence to the extent that we should, and we often rely on intuition when it would be more appropriate to engage in more effortful deliberate reasoning (Stanovich et al., 2016). Partly for that reason, we have not acquired the “mindware”—the concepts and the reasoning tools—that we need in order to estimate the relative value of different ways of doing good (ibid.). For instance, many people are unfamiliar with the concept of expected value, and their grasp of probabilistic reasoning is often shallow (Caviola et al. 2020b, Baron, 2000, Pinker, 2021).

Because of these biases and other shortcomings, utilitarians need to cultivate the virtue of truth-seeking. (Or “the scout mindset”, as the effective altruist Julia Galef (2021) calls it.) Instead of being partial in favor of views that they currently hold, or which they like for political or other reasons, they should try to be epistemically impartial, as far as possible. They should cultivate open-mindedness (Stanovich & West, 1997, Baron, 2018) about new and radical ideas. Instead of being overconfident, **they should be** humble and **willing to defer to experts.** And they should be rigorous or epistemically conscientious— they should be willing to do the hard work of identifying and scrutinizing relevant evidence, instead of going with intuition. Relatedly, they should be willing to learn the scientific mindware or thinking tools that are necessary to compare altruistic interventions.

# Mining CP

## NC

### NC

#### Second off: the mining counterplan

#### Counterplan: The Outer Space Treaty should be modified to clarify that the language in Article II prohibiting national appropriation does not apply to private companies

#### That solves- it preserves international mechanisms for dispute management and coop- AND- incentivizes asteroid mining

Heise, 18 -- Managing Notes Editor, Michigan Journal of International Law

[Jack, "Space, the Final Frontier of Enterprise: Incentivizing Asteroid Mining Under a Revised International Framework, 40 Mich. J. Int'l L. 189, 2018, <https://repository.law.umich.edu/mjil/vol40/iss1/5>, accessed 6-24-21]

III. A New International Framework to Govern the Space Economy

Asteroid mining creates tension within the OST as an activity that is prohibited by the treaty’s terms but largely in line with the treaty’s purpose. As such, the OST should be modified to allow for greater certainty and predictability with respect to asteroid mining. The possibility that asteroid mining could be illegal under international law likely disincentivizes entry into this new endeavor by adding risk and uncertainty. This section outlines what a revised framework should look like. First, the law governing space should remain international in nature to further the interests of peaceful cooperation and facilitate dispute resolution. Second, this framework should present minimal regulatory barriers for entry given the benefits that asteroid mining could bring to all mankind. The development of whaling law provides a use-ful historical example of how norms and rules for the asteroid mining industry could evolve in a way that facilitates efficient governance of this endeavor.

A. The Desirability of an International Framework

The preservation of space as a zone governed by international law, in contrast to a system predicated on national jurisdiction, is desirable in that it promotes peace, facilitates dispute resolution, and allows for more coordinated efforts in addressing issues relevant to all entities operating in space.98 As illustrated by the recent legislative activity in the United States and Luxembourg, the risk of inaction is the resultant domination of the extraterrestrial environment by individual nations rather than by international agreement.99 It would take only minor changes to the OST to resolve some of the ambiguities in the status quo and help bring the benefits of asteroid mining to humanity as a whole. A revision of this treaty rather than a wholesale abandonment of the agreement—whether that abandonment is in fact or merely in practice—would better maintain the international character of space.

The OST reflects Cold War era concerns about the militarization of space.100 Private companies, now ascendant in the growing space economy, simply do not have the military capacity or intention of sovereign governments. In short, the factual backdrop for the signing of the OST has changed. One straightforward means of authorizing private companies to extract space resources would be to revise the OST to clarify that the language in Article II prohibiting national appropriation does not apply to private companies. This could be achieved by simply adding a sentence to the end of Article VI: Under the revised treaty, companies shall remain under the supervision of the countries in which they are based but are not capable of national appropriation by use or occupation. This revision would create something of a line-drawing problem given the partnerships between sovereign space agencies and private companies,101 as well as a possible loophole by which unscrupulous nations could take advantage of the corporate form. Additional safeguards might be necessary to prevent this possibility. This revision could, however, promote peaceful coexistence and uniformity in space law, as well as create certainty as to the legality of asteroid mining by private companies.

Another possibility is to create a new set of international rules for extraction of space resources. Assignment of such property rights could take the form of a first-come, first-served system102 or it could depend on an Earth-side registration process.103 Arguably, extraction is different than the forbidden uses enumerated in the OST in that it is a temporary occupation and not inherently an exercise of military might or the flexing of sovereign muscle.104 While the United States and Luxembourg both interpret asteroid mining to be legal under the existing treaty,105 the promulgation of rules governing the endeavor would add clarity as to the legality of the enterprise. This approach would have the advantage of treating sovereign actors and private companies alike, but would require more substantial revision of the OST, or a new international agreement altogether.

An amended OST or a new treaty governing the extraction of space resources would have the benefit of maintaining the peaceful order of space. While admittedly the product of a different era, the post-national and peaceable foundation of the OST is still desirable in an international environment where many nations are armed to the proverbial nuclear teeth. Peaceful use of outer space is a laudable objective and one served most effectively by international agreement rather than by competing national claims of sovereignty.106

An international system would also facilitate dispute resolution. In a borderless and extra-jurisdictional realm like outer space, a system predicated on national sovereignty and ownership is not instructive as to whose laws—or whose choice of law rules—would control in the event of disputed title of an asteroid or the commission of a tort between two actors from different nations.107 The United Nations Convention on the Law of the Sea (the “UNCLOS”) established the International Tribunal for the Law of the Sea (the “ITLOS”) as a means of providing a venue in which similar disputes could be adjudicated between actors with conflicting legal regimes.108 Outer space has a great deal of similarity to the high seas: both are vast, both are easily treated as a non-appropriable international commons, and both are an in-between space in the sense of existing between bodies of terra firma. 109 An international mechanism like ITLOS ought to be established for resolving space disputes such that parties can seek a neutral arbiter to resolve conflict and laws can be uniformly applied to all entities irrespective of their country of origin.110

Finally, an international system could more easily allow for cooperation between nations and private entities in addressing issues that affect the spacefaring community as a whole. The emergence of space debris and the use of nuclear power sources in space are examples of developing issues that bear on the ease and safety of space travel for all.111 Left to national governments or individual corporations, it seems plausible that lack of oversight could result in a tragedy of the commons.112 By contrast, an international framework is well-suited to consider the problems of the space ecosystem in a way that transcends national boundaries. The UNCLOS Preamble, for example, demonstrates an awareness that “problems of ocean space are closely interrelated and need to be considered as a whole.”113 The compelling interests of peace, uniformity, and cooperation in outer space illustrate the desirability of an international framework to govern asteroid mining; to tweak rather than jettison the existing law. The resulting clarity and predictability would incentivize asteroid mining through reducing legal risk and uncertainty.

A counterproposal to an international framework is a system in which nations assign property rights according to domestic law. It would be possible to take a terra nullius approach to property rights relating to celestial bodies.114 In the Western Sahara advisory opinion, the International Court of Justice defined terra nullius as “a legal term of art employed in connection with ‘occupation’ as one of the accepted legal methods of acquiring sovereignty over territory.”115 For a nation to peaceably acquire sovereignty through occupation, the land must be “terra nullius—a territory belonging to no-one—at the time of the act alleged to constitute the ‘occupation[.]’ ”116 This legal approach was prevalent during the colonial era: explorers and emigrants acting in the name of European sovereigns declared ownership of territory by right of discovery and occupation.117 By authorizing U.S. citizens to extract materials from asteroids through the Commercial Space Launch Competitiveness Act, the United States has started down a path in which property rights in space flow from the jurisdiction of individual sovereign nations.118 Luxembourg has taken a similar approach through its own legislation.119

There are some notable advantages to this approach. The absence of an international policing or enforcement mechanism in space arguably points in favor of regulation by nations with spaceflight capacity. Given the generally acknowledged challenges of enforcing international law,120 one might wonder whether domestic governments might be better positioned to monitor and control private entities based within their borders. A nation-centric approach would also likely incentivize investment in asteroid mining, prompting countries and private actors to invest more aggressively so as not to lose the new space race.121 Assuming, as this Note does, that the development of the asteroid mining industry is in the interest of humanity as a whole, this approach has some appeal.

However, a nation-centric, first possession framework has drawbacks that highlight the desirability of an international governance regime for asteroid mining. First, the experience of colonization was one that prompted conflict between colonizers.122 The peaceful character of space is one of the great achievements of the OST, and it should not be jettisoned. Second, a regime characterized by national actors could spark a race to the bottom with respect to domestic regulation, leading to the same “flags of convenience” problem present in the maritime context as asteroid mining and spaceflight companies relocate to avoid taxes, labor and safety standards, and tort liability.123 An international framework, by contrast, could more easily prevent this problem by facilitating the creation of uniform standards for labor, safety, and liability, making relocation to under-regulated states a less attractive prospect. The drawbacks of a system governed by individual nations, in conjunction with the advantages of a global system illustrated above, point to the desirability of a revised framework governing asteroid mining that is international in character.

B. A System with Minimal Regulatory Barriers to Entry

Whatever approach is chosen to resolve the ambiguities in the OST ought not to be overly restrictive or create burdensome regulatory obstacles for private asteroid mining companies. Substantial regulation could discourage investment and hamper the development of an already capital-intensive and high-risk industry.124 The ideal regulatory system for asteroid mining should maintain an international character for the reasons described in the previous section but should not impose cumbersome regulation on asteroid mining companies at this stage in their development. Rather, allowing norms to develop over time through the resolution of disputes between asteroid mining companies would likely result in the most efficient regulatory system and would be more attractive to companies and nations that might be tempted to disregard the treaty.

The development of whaling custom offers insight into the extent to which “property rights may arise anarchically out of social custom.”125 The analogy to asteroid mining is strong in that both are extractive, high-risk, and capital-intensive industries that take place in what is effectively mare liberum (free sea).126 Herman Melville in Moby-Dick suggests the whaling industry was not governed by a “formal whaling code,” but rather that the “fishermen have been their own legislators and lawyers in this matter.”127 Over time, the custom developed that “I. A Fast-Fish belongs to the party fast to it [and] II. A Loose-Fish is fair game for anybody who can soonest catch it.”128 While Melville concedes that “the commentaries of the whalemen themselves sometimes consist in hard words and harder knocks—the Coke-upon-Littleton of the fist,”129 he also notes that this code is “universal, undisputed law applicable to all cases”130 that prevents “vexatious and violent disputes [arising] between the fishermen.”131 By and large, whalers were able to govern themselves by crafting norms over time that suited their needs.

Robert Ellickson, in his Hypothesis of Wealth-Maximizing Norms, cited the development of whaling norms as supporting the idea that, “when people are situated in a close-knit group, they will tend to develop for the ordinary run of problems norms that are wealth-maximizing.”132 Ellickson defines wealth-maximizing norms as those that minimize the sum of transaction costs and deadweight losses that the members of a group objectively incur.133 Those involved in the group activity are likely to develop rules in a utilitarian manner, preferring “bright-line rules that would eliminate arguments to fuzzy rules that would prolong disputes.”134 The few asteroid mining companies currently in existence are not only a close-knit group under Ellickson’s definition,135 but are best positioned to create rules that will give rise to greater clarity and reduce transaction costs due to their proximity to and soon-to-be-developed experience with the business of asteroid mining. Rules like these would incentivize asteroid mining through greater legal clarity and predictability, thus facilitating the delivery of asteroid mining’s benefits to all mankind.

The UNCLOS ratification debate helps illustrate why a more substantial regulatory regime might prove counterproductive for the international community. One of the primary reasons cited by American opponents of ratification is that accession to the treaty would subject American mining companies “to the whims of an unelected and unaccountable bureaucracy and would force them to pay excessive fees to the International Seabed Authority for redistribution to developing countries.”136 While other commentators have dismissed these concerns as “pure nonsense,” noting that these same companies favor accession to the treaty for the sake of having a clear legal claim to mined minerals,137 it is easy to imagine that a similar scheme of bureaucratic redistribution in the context of asteroid mining might be disregarded by the United States. A decision by nations leading the way on asteroid mining to opt out of a treaty would for all practical purposes cripple future treaty efforts. A key advantage of the proposed regulatory framework described in this Note is a practical one: it would offer the attractive prospect of legal clarity without an international bureaucratic bogeyman, making it more likely that key national stakeholders like the United States would sign on.

Conclusion

Maintaining the international character of outer space while allowing private companies to develop their own governing norms under a slightly revised OST would preempt the outbreak of a new race by sovereign governments to colonize space; create greater certainty for those undertaking the enterprise of asteroid mining; and permit the development of an efficient system tailored to maximize returns on celestial investment. The asteroid mining industry has the potential to confer benefits on all mankind as a means of facilitating space travel, spurring the development of science and technology, mitigating the potential for a calamitous asteroid impact, and facilitating climate change mitigation efforts. As such, it is in the interest of all nations to revise the OST to allow greater certainty in this endeavor. While the “entire unimaginable infinity of creation”138 is still out of reach based on our existing physics and engineering capabilities, asteroid mining is a critical step in beginning to harness celestial resources and more fully explore the intricacies of the universe around us.

#### Even pricing in the costs of mining, the economic benefits outweigh- the counterplan jumpstarts a space economy that spills over to tech innovation, planetary defense, and climate change

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[Jack, "Space, the Final Frontier of Enterprise: Incentivizing Asteroid Mining Under a Revised International Framework, 40 Mich. J. Int'l L. 189, 2018, <https://repository.law.umich.edu/mjil/vol40/iss1/5>, accessed 6-24-21]

A casual Internet search for asteroid mining is likely to turn up sky-high dollar value estimates of asteroids. From Neil deGrasse Tyson saying that asteroid mining will make the first trillionaire,12 to a Goldman Sachs note stating that a single asteroid could contain $25–$50 billion worth of platinum relative to a $2.6 billion cost of an asteroid-grabbing spacecraft,13 to reports that NASA is sending a probe to an asteroid worth $10,000 quadrillion, the profit element of this enterprise is not lost on observers.14 However, these estimates depend on the extraction of metals like platinum, their return to Earth, and sale at the current market price, which, as the aforementioned Goldman Sachs note concedes, would “crater the global price of platinum . . . .”15

Instead of attempting to mine metals, the initial step in asteroid mining proposed by Planetary Resources, the most prominent asteroid mining company in existence today, is to mine asteroids for water.16 By making propellant available in space, asteroid mining “increases the payload capacity of rockets, enables the creation of a space highway with fuel depots located at various points of need throughout the Solar System, and allows spacecraft to travel much farther.”17 In other words, the business of asteroid mining, at least in its infancy, is not about harvesting valuable metals and returning them to Earth,18 but rather about providing raw materials to enable the growth of the space economy.

The impetus to provide in-space materials to the space economy is a matter of physics. Launching an object into space is expensive: SpaceX’s Falcon 9—with the capacity to carry just over 50,000 pounds of payload into low Earth orbit19—costs an estimated $36.7 million to launch and uses between $200,000 and $300,000 in fuel each trip.20 If asteroid mining companies were able to provide some of the propellant in space, that would not only reduce fuel costs, but would reduce the overall launch weight, freeing up more space for payload.21

In sum, should asteroid mining companies be able to provide fuel in space, it could dramatically reduce the costs of transporting rockets and cargo into space—both into low Earth orbit and to more distant targets, like Mars. Having this infrastructure in place could also reduce the long-term costs of the asteroid mining business itself, given that the business model involves launching objects into space. While a 2012 study estimated the total cost of an asteroid retrieval mission at $2.6 billion,22 a substantial reduction in launch costs would result in meaningful savings.23 This model of asteroid mining as a provider of in-space resources, then, can facilitate the growth of the space economy: future forays into space would have their costs greatly reduced by a “space highway with fuel depots.”24

B. Public and Private Actors in the Asteroid Mining Space

Both private companies and the space agencies of sovereign governments bear mentioning in a full discussion of asteroid mining. The role of the private sector in space has expanded substantially in the past decade, leading some commentators to suggest that the private sector has eclipsed the public sector in this arena.25 The asteroid mining industry, as detailed above, both depends upon and tends to facilitate this development. Sovereign space agencies, by contrast, conduct a waning share of activity in space and increasingly operate by way of public-private partnerships as an investor in the space economy.26 This marks an important shift from the factual backdrop of the original OST in that private, independent companies are increasingly taking the wheel.

As explored above, the asteroid mining business facilitates the growth of the space economy by reducing launch costs. However, the future of asteroid mining as a lucrative industry also depends upon the existence and growth of a robust space economy. The symbiotic relationships that could develop between private companies deserves emphasis. The viability of asteroid mining depends on a space economy to which asteroid mining companies can sell fuel and metals: the lack of a current market in asteroid resources should resolve itself “when the space population hits critical mass, demanding infrastructure.”27 For spaceflight companies,28 a crucial component to reduce costs is access to propellant in space.29

Sovereign governments continue to play a significant, albeit declining, role in the space economy. NASA’s share of the national budget decreased from 4.4% in 1966 to 0.5% in 2014.30 Its current strategy centers on partnership with the private space economy: “NASA helps mitigate financial risk, while the private sector conducts research and innovation more efficiently than NASA can . . . .”31 Similarly Luxembourg, which lacks its own space agency,32 opened a 200 million Euro fund in 2016 to bring asteroid mining companies to the country.33 Planetary Resources has availed itself of opportunities offered by both NASA and Luxembourg, performing contract work with the former and securing funding from the latter.34

While sovereign governments do hold some of the purse strings relevant to asteroid mining companies and the space economy as a whole, private companies are increasingly displacing national space agencies.35 A private space economy that is increasingly independent from sovereign governments tends to undermine the factual framework upon which the original OST relied.36 Specifically, Article VI assigns responsibility for nongovernmental entities to national governments, the implicit assumption likely being that private entities would be acting at the behest of a sovereign.37 This concern is increasingly unsubstantiated in an environment in which private, independent companies are ascendant.38

C. Global Benefits of Asteroid Mining

Asteroid mining has the potential to facilitate space travel, an outcome the OST holds to be in the interest of humanity as a whole.39 The potential of asteroid mining to reduce the cost of spaceflight, moreover, could facilitate the growth of the space economy. Asteroid mining thus aligns with another stated purposes of the OST in the sense that an expanded space economy could provide substantial benefits to all mankind.40 First, in seeking to face the challenges posed by space travel, the public sector space race gave rise to numerous technological innovations, ranging from LEDs to emergency blankets to memory foam.41 It seems likely that the private space race would result in a similar degree of innovation, the products of which could benefit people across the globe.

Second, a successful mission to Mars could provide benefits beyond a mere sense of interplanetary accomplishment. NASA suggests that, given the parallels between the formation and evolution of Mars and Earth, a voyage there could help “us learn more about our own planet’s history and future.”42 The scientific advancements from such a mission cannot currently be anticipated and are difficult to predict, but “expand[ing] the frontiers of knowledge” in this manner could well bring benefits to all mankind.43

Third, the development of asteroid mining technology could also help advance asteroid diversion tactics. The development of the technology required to conduct successful asteroid mining operations could “help us to divert any incoming asteroids.”44 This is of great importance since NASA recently eliminated its Asteroid Redirect Mission due to funding cuts;45 NASA’s project was hailed by some scientists as a “critical step in demonstrating we can protect our planet from a future asteroid impact . . . .”46 Asteroid mining could step in and fill an important void. While the probability of an Armageddon-causing impact is low, the effects of an impact would be extremely severe.47 Even some mitigation of this risk as a byproduct of asteroid mining would be a benefit to humanity as a whole.

Finally, reduced launch costs could facilitate measures to combat global climate change. One proposed solution for canceling out predicted increases in average worldwide temperature is to “prevent[] . . . about 1% of incoming solar radiation—insolation—from reaching the Earth. This could be done by scattering into space from the vicinity of Earth an appropriately small fraction of total insolation.”48 Asteroid mining could facilitate such measures in that “[t]echnologies that could greatly decrease the cost of space-launch could make a telling difference in the practicality of all types of spacedeployed scattering systems of scales appropriate to insolation modulation.”49 There are certainly intermediate measures to combat climate change that ought to be taken first, but asteroid mining would facilitate this expedited solution. While some of the benefits of asteroid mining would doubtless accrue primarily to those nations with asteroid mining companies within their borders, the benefits noted in this section—space exploration as a general proposition, technological and scientific development, improvement of asteroid diversion technology, and facilitated means of swiftly countering climate change—would inure substantially to the benefit of all mankind.

#### Asteroids cause extinction­- causes famines and economic decline

Higgins, 18 -- correspondent at Vox

[Abigail, covers international development, global health, poverty, and gender. Before Vox she was a foreign correspondent and researcher in East Africa writing for The Washington Post, The Guardian, and Foreign Policy, among others, "10 ways the world is most likely to end, explained by scientists", 10-18-18, Vox, https://www.vox.com/future-perfect/2018/10/18/17957162/nuclear-war-asteroid-volcano-science-climate-change, accessed 12-4-19]

Asteroids are rocks that revolve around the sun and that occasionally collide with the Earth. An asteroid large enough to cause a global catastrophe hits Earth every 120,000 years, scientists estimate. It’s likely what killed the dinosaurs, and if an asteroid even one-tenth the size of the one that caused their extinction hit Earth today, the results would be devastating. Scientists estimate it could release enough particles to block the sun for months and cause a famine killing hundreds of millions.

NASA announced in 2011 that it had mapped more than 90 percent of objects in space larger than 1 kilometer in diameter, and that none of them are likely to hit Earth. But there’s still a lot we don’t know about smaller objects that, while unlikely to cause a global catastrophe, could have a big enough local impact to disrupt social and economic systems.

#### Warming turns nuclear war and death spirals make resilience impossible.

Beard et al. 21 [S.J. Beard, Lauren Holt, Asaf Tzachor, Luke Kemp, Shahar Avin, Phil Torres, and Haydn Belfield, \* Centre for the Study of Existential Risk, “Assessing climate change’s contribution to global catastrophic risk,” 2021, *Futures*, Vol. 127, https://doi.org/10.1016/j.futures.2020.102673, Table 1 & Fig. 2 Omitted]

3.1. Climate change and planetary boundaries

While most of the impacts of climate change so far have fallen within the range of what was experienced during the Holocene, the rate of change is faster than in the Holocene and we are now beginning to see climate change push beyond these boundaries. In the latest edition of the planetary boundaries’ framework, climate change is placed in the zone of increasing risk, implying that while this boundary has been breached, there remains some potential for normal functioning and recovery (Steffen et al., 2015). It thus lies between what the authors identify as the ‘safe zone’ and other ‘high risk’ transgressions, such as disruption to the biochemical flows of nitrogen and phosphorus and loss of biosphere integrity.

As part of their discussion of BRIHN Baum and Handoh (2014) note that climate change is the planetary boundary for which the risk to humanity has received most meaningful consideration and they suggest that this attention is deserved. Yet little research attention has been paid to climate change’s extreme or catastrophic effects. Kareiva and Carranza (2018) argue that, despite currently falling outside of the area of high risk, climate change has the clear potential to push humanity across a threshold of irreversible loss by “changing major ocean circulation patterns, causing massive sea-level rise, and increasing the frequency and severity of extreme events… that displace people, and ruin economies.” Even if humanity was resilient to each of these individual impacts, a global catastrophe could occur if these impacts were to occur rapidly and simultaneously.

One scenario that has received comparatively more attention is that of the global climate crossing a tipping point that would trigger environmental feedback loops (such as declining albedo from melting ice or the release of methane from clathrates) and cascading effects (such a shifting rainfall patterns that trigger desertification and soil erosion). After this point, anthropogenic activity may cease to be the main driver of climate change, making it accelerate and become harder to stop (King et al., 2015).

Other scenarios can be discerned from the numerous historical cases in which the modest, usually regional, climatic changes experienced during the Holocene have been implicated in the collapse of previous societies, including the Anasazi, the Tiwanaku, the Akkadians, the Western Roman Empire, the lowland Maya, and dozens of others (Diamond, 2005, Fagan, 2008). These provide a precedent for how a changing climate can trigger or contribute to societal breakdown. At present, our understanding of this phenomena is limited, and the IPCC has labelled its findings as “low confidence” due to a lack of understanding of cause and effect and restrictions in historical data (Klein et al., 2014). Further study and cooperation between archaeologists, historians, climate scientists and global catastrophic risk scholars could overcome some of these limitations by identifying how the impacts of climate change translate into social transformation and collapse, and hence what the impacts of more rapid and extreme climatic changes might be. There is also the potential for larger studies into how global climate variations have coincided with collapse and violence at the regional level (Zhang, Chiyung, Chusheng, Yuanqing, & Fung, 2005; Zhang et al., 2006). However, these need to be interpreted and generalized with care given the differences between pre-industrial and modern societies.

Societies also have a long history of adapting to, and recovering from, climate change induced collapses (McAnany and Yoffee, 2009). However, there are two reasons to be sceptical that such resilience can be easily extrapolated into the future. First, the relatively stable context of the Holocene, with well-functioning, resilient ecosystems, has greatly assisted recovery, while anthropogenic climate change is more rapid, pervasive, global, and severe. Large-scale states did not emerge until the onset of the Holocene (Richerson, Boyd, & Bettinger, 2001), and societies have since remained in a surprisingly narrow climatic niche of roughly 15 mean annual average temperature (Xu, Kohler, Lenton, Svenning, & Scheffer, 2020). A return to agrarian or hunter-gatherer lifestyles could thus have more devastating and long-lasting effects in a world of rapid climate change and ecological disruption (Gowdy, 2020).7 Second, modern human societies may have developed hidden fragilities that amplify the shocks posed by climate change (Mannheim 2020) and the complex, tightly-coupled and interdependent nature of our socio-economic systems makes it more likely that the failure of a few key states or industries due to climate change could cascade into a global collapse (Kemp, 2019).

A third set of plausible scenarios stem from climate change’s broader environmental impacts. Apart from being a planetary boundary of its own, Steffen et al. (2015) point out that climate change is intimately connected with other planetary boundaries (see Table 1). Climate change is thus identified by the authors as one of two ‘core’ boundaries with the potential “to drive the Earth system into a new state should they be substantially and persistently transgressed.” This transformative potential was elaborated on in subsequent work exploring how the world could be pushed towards a ‘Hothouse Earth’ state, even with anthropogenic temperature rises as low as 2 °C (Steffen et al., 2018).

The connection between climate change and biosphere integrity (the survival of complex adaptive ecosystems supporting diverse forms of life) is particularly strong. The IPCC is highly confident that climate change is adversely impacting terrestrial ecosystems, contributing to desertification and land degradation in many areas and changing the range, abundance and seasonality of many plant and animal species (Arneth et al., 2019). Similarly, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has reported that climate change is restricting the range of nearly half the world’s threatened mammal species and a quarter of threatened birds, with marine, coastal, and arctic ecosystems worst affected (Diaz et al., 2019). According to one estimate, climate change could cause 15–37 % of all species to become ‘committed to extinction’ by mid-century (Thomas et al., 2004).

Disruption to biosphere integrity can have profound economic and social repercussions, ranging from loss of ecosystem services and natural resources to the destruction of traditional knowledge and livelihoods. For instance, desertification, which threatens a quarter of Earth’s land area and a fifth of the population, is already estimated to cost developing nations 4–8 % of their GDP (United Nations, 2011). Many other rapid regime shifts involving loss of biosphere integrity have been observed, including shifts in arid vegetation, freshwater eutrophication, and the collapse of fish populations (Amano et al. 2020). There is a theoretical possibility of still more profound regime shifts at the global level (Rocha, Peterson, Bodin, & Levin, 2018). However, the contribution of loss of biosphere integrity to GCR is yet to be assessed. Kareiva and Carranza (2018) argue that it is unlikely to threaten human civilization, due both to a lack of plausible mechanisms for this threat and the fact that “local and regional biodiversity is often staying the same because species from elsewhere replace local losses.” However, in their classification of GCRs, Avin et al. (2018) suggest the potential for ecological collapse to threaten the safety boundaries of multiple critical systems with diverse spread mechanisms at a range of scales, from the biogeochemical and anatomical to the ecological and sociotechnological. Note that both these studies were conducted for largely conceptual purposes and should not be taken as rigorous analyses of this risk, this topic warrants further investigation.

3.2. Classifying climate change’s contributions to global catastrophic risk

Climate change’s contribution to GCR goes well beyond its impact on the earth system. Taking Avin et al.’s list of critical systems, we note that previous studies have mostly focused on the effects of climate change on physical and biogeochemical systems (e.g. global temperature and sea-level rise) or the lower-level critical systems that are most directly related to human health and survival (e.g. Heath Stress). However, these represent a very limited assessment of risk as it only accounts for climate change as a direct hazard/ threat and our "ontological" vulnerabilities to it. A more comprehensive risk assessment must consider the higher-order critical systems threatened by climate change passively (through a lack of alternatives) and actively (through intentional design).

The probability of a global catastrophe is higher when sociotechnological and environmental systems are tightly coupled, creating a potential for reinforcing feedback loops. If environmental change produces social changes that perpetuate further environmental change, then this could actively work against our efforts at adaptation. When this change has the potential to produce significant harm, via human vulnerabilities and exposure, we describe such loops as ‘global systems death spirals.’ These spirals could produce self-perpetuating catastrophes, whereby the energy and resources required to reverse or adapt to collapse are beyond the means of dwindling human societies. Feedback loops like this could thus create tipping points beyond which returning to anything like present conditions would become extremely difficult. Global systems would shift to very different states in which the prospects for humanity would likely be bleaker.

In the rest of this section, we explore just one potential spiral, between an ecological system (the biosphere) and two sociotechnological systems (the human food and global political systems). We explore each system and its interactions. Fig. 2 illustrates our model of this spiral.

3.2.1. The human food system

Climate change’s impact on biosphere integrity (discussed in the previous section) could harm the human food system due to loss of ecosystem services, disruption of the cycles of water, nitrogen and phosphates, and changes in the dynamics of plant and animal health (B´elanger & Pilling, 2019). Crossing this planetary boundary is already having severe implications for global food security, including loss of soil fertility and insect-mediated pollination (Diaz et al., 2019).

Systems for the production and allocation of food are already enduring significant stress. The sources of stress include climate change, soil erosion, water scarcity, and phosphorus depletion. The natural resource base, arable land and freshwater upon which food production rely are being degraded. While global food productivity and production has increased dramatically over the past century to meet rising demand from an expanding global population and rising standard of living, these constraints and risks are increasing the vulnerability of our global food supply to rapid and global disruptions that could constitute global catastrophes (Baum, Denkenberger, Pearce, Robock, & Winkler, 2015).

Climate change will further reduce food security in at least three interconnected ways. First, it will affect growing conditions, including direct threats to agricultural yields from heat, humidity, and precipitation in many regions; although initially improving conditions in some (Lott, Christidis, & Stott, 2013). Second, it will increase the range of agricultural pests and diseases (Harvell et al., 2002). Third, it will increase the occurrence of extreme weather events that impair the integrity of food production and distribution networks, from production to harvest, post-harvest, transport, storage, and distribution, thereby increasing our vulnerability and exposure to supply shocks (Bailey et al., 2015). The IPCC estimates, with medium confidence, that at around 2 °C of global warming the risk from permafrost degradation and food supply instabilities will be ‘very high’, while at around 3 °C of global warming the risk from vegetation loss, wildfire damage, and dryland water scarcity will also be very high (Arneth et al., 2019). Very few studies have considered the impacts of 4 °C of global warming or more; however, the IPCC highlighted one study finding that any potential agricultural gains from climate change will be lost by this point and there could be a decrease of 19 % in maize yields and 68 % in bean yields in Africa, an 8 % reduction in yields in South Asia, and a substantial negative impact on fisheries by 2050 (Porter et al., 2014). Furthermore, multiple extreme weather events could disrupt food distribution networks (Bailey and Wellesley, 2017).

While there are opportunities to adapt, disruption to the entire global food system cannot be resolved via food aid alone. Indeed, there is the potential for isolationist or heavy-handed responses that would do more harm than good. Given the high degree of interconnectivity and feedback within the global food system, our initial research suggests that any one of these climate change effects could trigger scenarios that would critically undermine the global food system’s ability to meet the minimum nutrition for well-being; making food security for all an unachievable goal, let alone rise to the challenge of continuing to grow (A. Tzachor, 2019, 2020); this would constitute what Kuhlemann (2019) terms a ‘threshold of significance.’

3.2.2. The global political system

Disrupting the global food system can create and exacerbate conflict and state failure (Brinkman & Hendrix, 2011). However, once again, this needs to be seen against the backdrop of a global political system under stress, with climate change as a significant contributing factor. Climate change influences political systems in many ways, from being a locus of activism and a stimulus for reform to driving rising inequality and population displacement (Arneth et al., 2019; Diffenbaugh & Burke, 2019). This is not a new phenomenon, changes in the climate are believed to have contributed to conflict between people and states throughout human history, driven by resource scarcity, population displacement, and inequality (Lee, 2009; Mach et al., 2019). As part of a comprehensive risk assessment of climate change, King et al. (2015) conducted an extensive literature review on climate change and conflict and used this to inform a series of international wargaming exercises. These found that climate change is expected to increase international conflict while highlighting the role that population displacement, state failure, and water and food insecurity would play in this (see also Mach et al., 2019; Natalini, Jones, & Bravo, 2015).

Quantitative studies of the impact of climate change on violence and conflict have provided more mixed results. A survey of empirical studies by Detges (2017) found that there may be multiple differing trends: extreme weather events appear to have more significant effects on violence than do long-term climate trends, while levels of small-scale conflict and interpersonal violence appear to be more affected than large-scale conflicts and international war. Empirical studies also highlight how climate change’s impact on conflict is predominantly as a risk multiplier and intensifier. Thus, climate change may contribute more by increasing our vulnerability to other conflict-inducing factors, such as loss of livelihood, forced migration, environmental change, and food insecurity, than by acting as a direct cause of conflict (Abel, Brottrager, Cuaresma, & Muttarak, 2019; Hsiang, Burke, & Miguel, 2013; Schubert et al., 2008).8

Of particular relevance to GCR is the effect of climate change on the risk of nuclear war (Parthemore, Femia, & Werrell, 2018). However, to our knowledge, this has never been rigorously assessed, although the potential is certainly there. One recent model of the risk of nuclear war highlighted how varied, and common, incidents with the potential to trigger a nuclear exchange are (Baum, de Neufville, & Barrett, 2018). It outlined 14 different causal pathways to an exchange, including the escalation of conventional wars and international crises, human error, and the emergence of new non-state actors. For all but two of these, they identify historical examples of potentially precipitating incidents, with 60 incidents in total (i.e. a little less than one a year). This suggests that the absence of nuclear war was less due to a lack of potential causes, tan the global political system’s ability to defuse them. Thus, the real significance of climate change may be its capacity to undermine this system: the combination of social, political, and environmental disruption, a lingering sense of global injustice, and rising food, water, and energy insecurity could increase the probability that crises escalate or that false alarms are mistaken for genuine emergencies. This topic needs further research.

3.3. The emergence of a global systems death spiral

Yet, we should not conclude that a nuclear exchange is the only, or even most likely, scenario in which political instability might produce a global catastrophe. Conflict and political instability, even of moderate severity, are themselves two of the most significant drivers of biodiversity loss due to breakdowns in monitoring, governance, and (public and private) property rights (Baynham-Herd, Amano, Sutherland, & Donald, 2018). This closes a potentially reinforcing feedback loop between loss of biosphere integrity, food insecurity and political breakdown.

The mechanisms by which these cascading failures might spread include many of the natural, anthropogenic, and replicator effects identified by Avin et al. (2018), making them harder to contain. At the natural level, climate change involves changes to the global atmospheric and biogeochemical systems and poses other naturally spreading harms, like global ecological collapse. At the anthropogenic level, the global interconnectedness of sociotechnological systems means that while small shocks are easier to recover from, larger shocks can be harder to contain and control. Finally, biological and informational replication can also spread the negative impacts of climate change, from vector-borne diseases and invasive species to climate fatalism and dangerous geoengineering technologies.

Given these numerous spread mechanisms, critical system failures could precipitate global catastrophes. Furthermore, the spiral we have explored is unlikely to be the only set of interlinked systemic disruptions that climate change could initiate (other death spirals could involve bio-insecurity and disease), nor are these the only causal connections between these three systems. Until we understand the nature of such death spirals better, we must act cautiously. We now turn to consider what this would mean.

### T

#### The exclusive role of the affirmative is to defend the resolution as a general moral principle.

#### “The appropriation of outer space” suggests the topic is about appropriation as a singular concept, not one instance of appropriation among many

Breckenridge 9

Wylie Breckenridge (lecturer in philosophy at Charles Sturt University, Wagga Wagga, Australia; PhD, Oxford). “On Russell's Theory of Definite Descriptions.” 9 December 2009. JDN. <http://wylieb.com/Philosophy/DipArts/Russell.pdf>

Second, he appeals to the similarity of definite descriptions with indefinite descriptions - phrases like 'a man', 'some man', 'all men', etc. It is intuitively acceptable to say that in 'Some man is my father' the indefinite description 'Some man' does not purport to refer to any particular thing, and that the statement can be interpreted as 'There is least one man that is my father'. Russell claims that 'The man is my father' is just like 'Some man is my father', except that it also asserts uniqueness. So it should be interpreted in a similar vein as 'There is at least one man that is my father, and there is at most one man that is my father', or as 'There is **exactly one** man that is my father'. In general, he claims that it is natural to move from interpreting 'Some Φ is Ψ' as 'At least one Φ is Ψ' to interpreting 'The Φ is Ψ' as 'At least one thing is Φ, at most one thing is Φ, and whatever is Φ is Ψ'. Third, he shows how **his theory can solve** three **'puzzles' about definite descriptions.** The first is the problem about 'The evening star' and 'The morning star'. (The example that Russell uses is actually about 'Scott' and 'The author of Waverley', but I'll stick to the morning and evening stars.) The problem is that the truth of 'The evening star is the morning star' is interesting, and yet when we replace 'the morning star' by 'the evening star' (which denotes the same thing) we get the uninterestingly true statement 'The evening star is the evening star'. Russell's solution is that the apparently co-referring definite descriptions do not refer at all. The original statement is not about a thing called 'the morning star'; it just includes a claim about the unique existence of a thing with certain properties. So we cannot make the substitution in the way suggested. The second puzzle is that some statements involving definite descriptions seem to defy the law of the excluded middle. According to it, the King of England is either bald or not bald and so at least one of 'The King of England is bald' and 'The King of England is not bald' must be true. But if we listed all of the things which are bald and all of the things which are not bald we would not find the King of England on either list (because there is no King of England). So it seems that neither is true. Russell's solution is to point out that the law of the excluded middle says that the King of England is either on the first list or not on the first list. But not being on the first list is not the same as being on the second list - this is the important distinction between the two interpretations of 'The King of England is not bald' that we noted above. For the law of the excluded middle to hold, it only has to be the case that the King of England is either on the first list or not on the first list (and that is the case). It does not have to be the case that the King of England is either on the first list or on the second list (just as well - because this is not the case). The third puzzle came up in part I as well - how can we talk about things that do not exist in order to (truthfully) deny their existence? If we can talk about them then mustn't they, in some sense, exist? (Meinong thought yes.) Russell thinks no. His solution we have already seen - to deny that in the statement 'The greatest prime number does not exist' the word 'exists' is used as a predicate. Rather, the statement should be interpreted as saying 'It is not the case that there is exactly one greatest prime number'.

#### Use of the bare plural term “private entities” suggests the topic is a generic generalization. Linguistics, logic, and common usage prove.

Bile 87

Bile, Jeff (Former head coach of Southern Illinois University, where he coached 4 consecutive national championship). "When the Whole is Greater than the sum of the Parts: The Implications of Holistic Resolutional Focus". In CEDA Yearbook. Vol. 8, Edt., Brenda Logue. JDN. 1987.

The second rationale for holistic focus is that generic interpretation is **most compatible** with “rules" of interpretation in light of a "missing modifier." Most of us would consider the proposition “birds can fly" as true even though we are aware of some that can’t, because we intuitively insert the generic modifier "most” in front of birds" or "typically/ generally" in front of "fly." This intuition is semantically “correct." Linguist John Lyons (1981) argues: What is meant by 'generic' may be seen by considering such sets of sentences as the following: 1) The lion is a friendly beast. 2) A lion is a friendly beast. 3) Lions are friendly beasts. Each of these sentences may be used to assert a generic proposition: i.e. a proposition which says something, not about this or that group of lions or about any particular individual lion, but about the class of lions as such . . .' (p. 193). Lyons continues by indicating that the "kind of adverbal modifier that suggests itself for insertion" is one "that approximates in meaning to ‘generally,’ 'typically,’ ‘characteristically,’ or ‘normally’" (p. 195). While semantic rules support generic interpretation, the field of logic provides additional supportive “rules." Logicians tend to interpret "indesignate form" propositions with missing quantification modifiers as universal or as expressing "group tendency" (Barnstable. 1975). Van Der Auwera (1985. p. 188) argues that when choosing "between the generic or the non-generic or particular" reading of the statement “A whale lives in the sea," that **in "most contexts," the "preferred interpretation" is generic.** He further argues that while interpretation should be guided by context that **there "are some cases**, however, **where the choice is independent of context**." He gives the statement “Kangaroos have no tails” as a statement which “is **always generic**.” Logical conventions would certainly reject a particularized topic rendering.

#### “Resolved” implies a general principle

Coburn-Palo and Luong 96

Nicholas Coburn-Palo (Assistant Debate Coach and Instructor in the Department of Communication at Weber State University, formerly a fulltime speech instructor and Director of Debate at The Pinewood College Preparatory School, and formerly an active member of the National Tournament of Champions Advisory Committee) and Minh Luong (Assistant Professor in the Ethics, Politics, & Economics Program at Yale University and International Affairs Fellow at the Yale Center for International and Area Studies), “Resolutional focus in policy argumentation: theory and application.” NFL Rostrum, January, 1996. JDN. https://debate.uvm.edu/NFL/rostrumlib/cxluong0196.pdf

Another reason why it would be logically correct to consider the resolution as the focus of the debate is the presence of alternative phrasing possibilities.9 The term "resolved" has appeared in all contemporary policy debate resolutions and a **review of the literature** indicates that the term implies a firmness or determination in reference to the claim which is being upheld.10 This interpretation **would** seem to **render atypical examples irrelevant** because no firmness or determination could be demonstrated in reference to the statement to which "resolved" applies. At an absolute minimum, there is **no linguistic reason** to believe that the resolution is meant as a boundary from which the affirmative is free to pick any example. Indeed, the authority of the topic selection committee to phrase the topic any way it wishes would seem to indicate that they at least have the option to permit the possibility of resolutionally-focused debate. The committee could have phrased the resolution as: Resolved: That a plan of the affirmative's choosing should be adopted by the United States government which would substantially change its foreign policy toward the People's Republic of China.

#### 1. Topic literature

#### The main legal question of the topic is general, not particular

Oduntan 5

Gbenga Oduntan (Lecturer in Law, Canterbury Christ Church University College, England; Legal Adviser to the Nigerian Government and Member, United Nations Nigerian/Cameroon Mixed Sub-Commission on the Demarcation of the Boundary between Nigeria and Cameroon) Imagine There Are No Possessions: Legal and Moral Basis Of The Common Heritage Principle In Space Law. Manchester Journal of International Economic Law, 2 (1). pp. 30-59. ISSN 1742-3945. 2005. JDN. https://kar.kent.ac.uk/1767/1/Imagine%2520There%2520are%2520No%2520Possessions.pdf

To begin with it must be noted that the **common heritage principle** is fast becoming part of **c**ustomary **i**nternational **l**aw. It constitutes a distinct basic principle providing **general but not specific legal obligations** with respect to the utilisation of areas beyond national jurisdiction. It inherently conflicts with the principle of sovereignty since it operates from the basis of regarding an environment as 'international public utility' requiring the obligation to co-operate. 13 The CHM principle was first introduced to cover outer space by the words contained in Article 1 of the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space of 1962.14

By the time the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Borders (1967)15 was drafted the resolve of states to render outer space a commons for all humanity had deepened. This led to the formulation of another interesting phraseology. In the discussion of the drafting of Article 1 of the Space Treaty (1967) the choice was between the terms ‘province of mankind’ and ‘common heritage’. Eventually the former phraseology was adopted because it was thought to reflect more closely the principles of the freedom of outer space and the **prohibition of appropriation.** However, it must be said that introduction of the newer phrase ought not to lead to any confusion nor does this prove that these phraseologies are mere declarations of intention as some writers have mischievously suggested.

Eventually, clear reference to this term was rendered in Article 11 (1) of the Agreement Governing the Activities of States on the Moon and other Celestial Bodies (1979). 16 It provided that: “The moon and its natural resources are the common heritage of mankind”. In addition to this, Article 4 (1) of the Moon Agreement combines the two terms in the following manner:

"The exploration and use of the moon shall be the province of all mankind and shall be carried out for the benefit and in the interests of all countries irrespective of their degree of economic or scientific development".

It would, therefore, appear that as used in the Moon Agreement (1979) both terms emphasise different things although they are geared towards achieving the same noble objective. Article 4 (1) emphasises the co-operation of states parties in all their undertakings concerning the moon and other celestial bodies; on the other hand Article 11 coupled with Article 5 in particular provide the CHM Principle with **legal teeth.**

#### There is value in discussing the general principles underlying space law—specifying a context is neither necessary nor helpful

Noyes 11

John E. Noyes (the Roger J. Traynor Professor of Law, California Western School of Law). “The Common Heritage of Mankind: Past, Present, and Future.” 40 Denv. J. Int'l L. & Pol'y 447 (2011). JDN. <https://digitalcommons.du.edu/cgi/viewcontent.cgi?article=1156&context=djilp>

IV. IMPLEMENTING THE **COMMON HERITAGE PRINCIPLE** IN TREATY LAW

**Legal principles have value even if left in general terms.** Indeed, it is not always desirable to convert broad principles into more concrete or determinate rules. Principles of international law57 may fill gaps in rules and provide decision makers with a guiding mindset - a reminder of basic objectives of the law - when they interpret or apply rules. Principles, when applied in good faith, also allow for, in David Caron's words, "diversity within convergence."5 8 That is, they may accord different states discretion to pursue a common objective in different ways, in line with particular domestic political and legal arrangements. **A** legal **principle need not be incorporated in** treaty **law** in order **to have significance.** Indeed, even as soft law, political concept, or "emerging customary international law," a principle may be used to influence debates and shape legal developments.

#### Ethics education turns policy education for space law

Freeland 5

Steven Freeland (BCom, LLB, LLM, University of New South Wales; Senior Lecturer in International Law, University of Western Sydney, Australia; and a member of the Paris-based International Institute of Space Law). “Up, Up and … Back: The Emergence of Space Tourism and Its Impact on the International Law of Outer Space.” Chicago Journal of International Law: Vol. 6: No. 1, Article 4. 2005. JDN. <https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1269&context=cjil>

VII. SOME ETHICAL DIMENSIONS OF AN INTERNATIONAL LEGAL REGIME FOR SPACE TOURISM

As has been mentioned above, the development of the space tourism industry challenges basic precepts of the international law of outer space. From a practical viewpoint, it is clear that the existing legal regime must be amended and expanded to meet the requirements of this burgeoning industry. If we assume that the expansion of our universe (quite literally) through the advent of space tourism activities represents a positive, almost inevitable direction for humankind, then these legal changes must provide for appropriate incentives and protections in order to encourage the development of the industry. However, it is not only the "hard law" provisions that require reassessment. **It is** also **necessary to consider the complex ethical questions** that arise, since **these are highly relevant** to the direction to be taken in the future development of international space law. A number of these are briefly raised below.

#### Moral questions are the center of space law lit—specifically on private property questions

Oduntan 5

Gbenga Oduntan (Lecturer in Law, Canterbury Christ Church University College, England; Legal Adviser to the Nigerian Government and Member, United Nations Nigerian/Cameroon Mixed Sub-Commission on the Demarcation of the Boundary between Nigeria and Cameroon) Imagine There Are No Possessions: Legal and Moral Basis Of The Common Heritage Principle In Space Law. Manchester Journal of International Economic Law, 2 (1). pp. 30-59. ISSN 1742-3945. 2005. JDN. https://kar.kent.ac.uk/1767/1/Imagine%2520There%2520are%2520No%2520Possessions.pdf

6. 1. The Significance of Morality

The claim by some writers that there is no room for morality in the creation of international law deserves some consideration. It is thought for instance, that moral considerations are unnecessary in space law since there have been no serious conflicts with respect to outer space. Also connected to this is the argument that the lack of a demarcation between the airspace and outer space has not generated any serious conflicts. Plausible as these arguments may sound they are not acceptable because it is very possible that serious conflicts have been avoided so far as a result of the moral content and equitable considerations inherent in the law. In other words, military and political conflicts may have been defused well ahead by the existence of those very laws which critics of the present regime claim are unnecessary.67

The assertion of Sir Harold Nicolson that "[t]here does not exist such a thing as international morality" is **inapplicable to air and space law.**68 The preferred view is that held by Arnold Wolfers who wrote; "the ‘necessities’ in international politics, and for that matter in all spheres of life (that states) do not push decision and action beyond the realm of moral judgment”. **It is an undisputable fact that** considerations of **morality had an influence** on the development of air law. Examples of this include the universal response to the heinous crime of aerial hijack; the formulation of the aut dedere aut punire principle in air treaties and Article 3 of the Chicago Convention, which states that states must refrain from the use of weapons against civil aircraft in flight as being incompatible with elementary considerations of humanity (Declaration 4).69

Clearly this is one of the reasons why **the major** air and **space treaties are replete with provisions** that recognise the imperatives of preventing economic avarice from making an inroad into spatial territories.70 Rules of law, which permit **commercial exploitation for private ends**, were not advanced even though the Cold War was raging around the time the first space flight and the first moon landings took place. Indeed the United States delegate after the approval of the Moon Agreement by the COPUOS and Committee Four of the General Assembly in 1979 stated expressly that this ‘balanced’ and ‘reasonable’ agreement “would have to meet the approval of the United States Senate”. 71 The United States also committed itself to future participation in negotiations respecting the establishment of an international regime for governing the exploitation of the moon’s natural resources. International law and politics is, therefore, rooted in ethics. States and non-state actors share a basic moral vocabulary. Therefore, if a sceptic of space law poses the question, what stops a state from acquiring outer space resources solely for its exclusive use and in an unbridled manner, the answer would be **"international law forbids it".** It may also be asserted that unbridled exploitation of the moon’s natural resources without reference to the expectation that it is an international commons also offends international morality. Needless to say any state(s) which disregard this attacks the rationale of its own peaceful existence. This reasoning is further reinforced by the experience of the erstwhile USSR, which was a space power and the pioneer in manned space flight. As events turned out the USSR today exists no more and Russia the main successor to its outer space programmes can hardly fund space exploration. In fact it has recently lost its last independent space station -the Mir station. Fortunately the USSR had from the beginning of its involvement with space activities acknowledged more or less that outer space is res omnium extra commercium. If this had not been so, it would have secured for itself a merely transient victory.72

#### 2. Precision

#### The neg interp has the best explanatory power for why the resolution is worded the specific way that it is. The wording of previous topic this year demonstrates that when the topic is intended to be about a specific agent and course of action, the topic committee uses phrasing like “Member nations of the WTO ought to…”. The lack of an agent as well as use of the static verb phrase “is just” is better explainable by the topic being intentionally worded as a general principle than as a demand to debate ill-defined policies with an unclear agent.

#### Precision is a ceiling, not a floor. You should vote for the most intuitive and straightforward reading, not just any one that is minimally plausible, because the fundamental function of the topic is to keep everyone on the exact same page when coordinating research expectations, and that breaks down if each person has their own pet interp they think is most pragmatic.

#### 3. Limits

#### The topic has no clear agent and no clear limit on which areas of space or private companies are included. There is also no temporal limit, which compounds the abuse on a topic where most of the possible technologies are in the future and often the far future. There are literally millions of permutations of agents, regions of space, companies, and technologies that the aff could defend. That is an impossible neg research burden for a tournament that’s only two weeks after topic release.

#### Drop the debater on T—the damage was done and I can’t regive the 1NC after a 1AR shift. Use competing interps; it avoids arbitrariness and judge intervention.

### 2NR OV

#### Mining produces 3 global benefits:

#### First, innovation- a new private space race accelerates tech innovation which has broad economic benefits- the Space Race proves. That turns the inequality advantage- innovation spurs economic growth and innovation benefits spill down to help the least well off, reducing inequality

#### Second, planetary defense- asteroids cause extinction- even a single hit by a small asteroid would decimate the economy- that turns the inequality advantage because it shreds growth- AND- any sufficiently large asteroid would kill millions on impact and blot out the sun which causes a global famine and causes extinction- that’s Higgins

#### Even a small dent in reducing the probability of an otherwise inevitable asteroid impact swamps every 1AC impact and is a global good that reduces global existential risk- that’s Heise. Only asteroid mining solves- a space economy creates infrastructure for developing new asteroid diversion tech including deflection, surveillance, and fragmentation techniques

#### Third, climate change- that causes extinction- it causes resource wars over food and water- it’s a conflict magnifier that makes all conflict intensify in both frequency and severity which turns the aff’s war impacts, and also hits the worst off first- that’s Beard. Mining decreases the costs of space launch which is key to the deployment of scattering tech that reduces the amount of solar radiation that hits the Earth and mitigates climate change- that’s Heise