## T vs Subsets of Appropriation

#### 1. The topic is a general moral principle.

#### 2. “The appropriation of outer space” represents a generic generalization

Nebel 20 [Jake Nebel is an assistant professor of philosophy at the University of Southern California and executive director of Victory Briefs. He writes a lot of this stuff lol – duh.] “Indefinite Singular Generics in Debate” Victory Briefs, 19 August 2020. no url AG

I agree that if “a democracy” in the resolution just meant “one or more democracy,” then a country-specific affirmative could be topical. But, as I will explain in this topic analysis, that isn’t what “a democracy” means in the resolution. To see why, we first need to back up a bit and review (or learn) the idea of generic generalizations.

We have already seen some examples of **generics** that are not bare plurals: “A whale is a mammal,” “A beaver builds dams,” and “The woolly mammoth is extinct.” The first two examples use indefinite singulars—singular nouns preceded by the indefinite article “a”—and the third is a **definite singular** since it is preceded by the definite article “the.” Generics can also be expressed with bare singulars (“Syrup is viscous”) and even verbs (as we’ll see later on). The resolution’s “a democracy” is an indefinite singular, and so it very well might be—and, as we’ll soon see, is—generic.

But it is also important to keep in mind that, just as not all generics are bare plurals, not all bare plurals are generic. “Dogs are barking” is true as long as some dogs are barking. Bare plurals can be used in particular ways to express existential statements. The key question for any given debate resolution that contains a bare plural is whether that occurrence of the bare plural is generic or existential.

The same is true of indefinite singulars. As debaters will be quick to point out, some uses of the indefinite singular really do mean “some” or “one or more”: “A cat is on the mat” is clearly not a generic generalization about cats; it’s true as long as some cat is on the mat. The question is whether the indefinite singular “a democracy” is existential or generic in the resolution.

Now, my own view is that, if we understand the difference between existential and generic statements, and if we approach the question impartially, without any investment in one side of the debate, **we can almost always just tell which reading is correct just by thinking about it.** It is clear that “In a democracy, voting ought to be compulsory” doesn’t mean “There is one or more democracy in which voting ought to be compulsory.” I don’t think a fancy argument should be required to show this any more than a fancy argument should be required to show that “A duck doesn’t lay eggs” is a generic—a false one because ducks do lay eggs, even though some ducks (namely males) don’t. And if a debater contests this by insisting that “a democracy” is existential, the judge should be willing to resolve competing claims by, well, judging—that is, by using her judgment. Contesting a claim by insisting on its negation or demanding justification doesn’t put any obligation on the judge to be neutral about it. (Otherwise the negative could make every debate irresolvable by just insisting on the negation of every statement in the affirmative speeches.) Even if the insistence is backed by some sort of argument, we can reasonably reject an argument if we know its conclusion to be false, even if we are not in a position to know exactly where the argument goes wrong. Particularly in matters of logic and language, speakers have more direct knowledge of particular cases (e.g., that some specific inference is invalid or some specific sentence is infelicitious) than of the underlying explanations.

#### 3. The plan only applies to a subset of a subset of the topic as a whole.

#### 4. They also independently violate resolved.

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.

#### 5. Vote neg

#### 6. Limits

#### 7. 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.

#### 8. 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.

#### 9. 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.

## Inherency

#### 1. Next off is inherency

#### 2. Their solvency advocate is mis-cut and they should lose. They’re reading the strawperson portions of the Tronchetti evidence where he quotes other people. He concludes that private appropriation is already banned by the OST and does not advocate any new optional protocol.

Saratoga’s tag:

“We’ll defend normal means as the signatories of the OST adding an optional protocol under Article II.”

#### 3. The OST bans private appropriation [CATONSVILLE READS YELLOW]

Tronchetti 7[Fabio Tronchetti is a professor at the International Institute of Air and Space Law, Leiden University, The Netherlands, 2007, <https://iislweb.org/docs/Diederiks2007.pdf>, 12-15-2021 amrita]

ARTICLE II OF THE OUTER SPACE TREATY: A MATTER OF DEBATE The legal content of Article II of the Outer Space Treaty is one of the most debated and analysed topic in the field of space law. Indeed, several interpretations have been put forward to explain the meaning of its provisions. Article II states that: “Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means”. **The text of Article II represents** the final point of a process, formally initiated with Resolution 1721, aimed at conferring to outer space the status of res communis omnium, namely a thing open for the **free exploration** and use by all States **without the possibility of being appropriated**. By prohibiting the possibility of making territorial claims over outer space or any part thereof based on use or occupation, Article II **makes clear that** the customary procedures of **i**nternational **law allowing** subjects to obtain **sovereignty rights over un-owed lands**, namely discovery, occupatio and effective possession, **do not apply to** outer **space.** This prohibition was considered by the drafters of the Outer Space Treaty the best guarantee for preserving outer space for peaceful activities only and for stimulating the exploration and use of the space environment in the name of all mankind. What has been the object of controversy among legal scholars is the question of whether both States and private individuals are subjected to the provisions of Article II. Indeed, **while Article II forbids** expressis verbis the national **appropriation by** claims of **sovereignty**, by means of use and occupation or other means of outer space, **it does not** make **a**ny explicit **mention** **to** its **private** appropriation. Relying on this consideration, some authors have argued that the private appropriation of outer space and celestial bodies is allowed. For instance, in 1968 Gorove wrote: “Thus, at present an individual acting on his own behalf or on behalf of another individual or private association or an international organisation could lawfully appropriate any parts of outer space…”6 . The same argument is used today by the enterprises selling extraterrestrial acres. They base their claim to the Moon and other celestial bodies on the consideration that Article II does not explicitly forbid private individuals and enterprises to claim, exploit or appropriate the celestial bodies for profit7 . However, it must be said, that nowadays there is a general consensus on the fact that **both national appropriation and private** property rights **are denied** under the Outer Space Treaty. Several way of reasoning have been advanced to support this view. **Sters and Tennen affirm that** the argument that Article II does not apply to private entities since they are not expressly mentioned fails for the reason that they do not need to be explicitly listed in Article II to be fully subject to the non-appropriation principle8 . **Private entities are allowed to carry out** space **activities but**, according to Article VI of the Outer Space Treaty, they **must be authorized** to conduct such activities **by the** appropriate **State** of nationality. But if the State is prohibited from engaging in certain conduct, then it lacks the authority to license its nationals or other entities subject to its jurisdiction to engage in that prohibited activity. **Jenks argues that** “States bear international responsibility for national activities in space; it follows that what is forbidden to a State is not permitted to a chartered company created by a State or to one of its nationals acting as a private adventurer”9 . It has been also suggested that **the prohibition of national** appropriation **implies prohibition of private** appropriation because the latter cannot exist independently from the former10. In order to exist, indeed, private property requires a superior authority to enforce it, be in the form of a State or some other recognised entity. In outer space, however, this practice of State endorsement is forbidden. Should a State recognise or protect the territorial acquisitions of any of its subjects, this would constitute a form of national appropriation in violation of Article II. Moreover, it is possible to use some historical elements to support the argument that both the acquisition of State sovereignty and the creation of private property rights are forbidden by the words of Article II. During the negotiations of the Outer Space Treaty, the Delegate of Belgium affirmed that his delegation “had taken note of the interpretation of the non-appropriation advanced by several delegations-apparently without contradiction-as covering both the establishment of sovereignty and the creation of titles to property in private law”11. The French Delegate stated that: “…there was reason to be satisfied that three basic principles were affirmed, namely: the prohibition of any claim of sovereignty or property rights in space…”12. The fact that the accessions to the Outer Space Treaty were not accompanied by reservations or interpretations of the meaning of Article II, it is an evidence of the fact that this issue was **considered to be settled during the negotiation** phase. Thus, summing up, we may say that **prohibition of appropriation of outer space** and its parts is a rule which **is valid for both private and public entity**. The theory that private operators are not subject to this rule represents a myth that is not supported by any valid legal argument. Moreover, it can be also added that if any subject was allowed to appropriate parts of outer space, the basic aim of the drafters of the Treaty, namely to prevent a colonial competition in outer space and to create the conditions and premises for an exploration and use of outer space carried out for the benefit of all States, would be betrayed. Therefore, **the need to protect the non-appropriative nature o**f outer **space emerges** in all its relevance.

#### 4. Three impacts

#### 5. Vote neg for evidence ethics. This card not only does not support the tagline—it says the exact opposite, and the highlighted lines largely come from the parts of the card the author is actively disagreeing with.

#### 6. Academic integrity comes first—a basic level of trust that authors are being represented accurately is a pre-requisite to all debate over evidence. You would get a failing grade for this in school.

#### 7. Independently, it means the plan isn’t inherent. Their own evidence concludes that the OST (which has been ratified by all the relevant countries described in their advantage) has already banned lunar mining. Inherency is a prima facie voter and key to education over the plan.

Zarefsky 87

[David Zarefsky, Professor and Associate Dean of Northwestern University, ADVANCED DEBATE, 1987, p.211]

Similarly, inherency becomes a crucial consideration. Some answer must be offered to the causal question, “Absent the action envisioned by the proposition, why would presumably good people tolerate evil?” It will not do to report “the facts” and then to infer, without analysis, the existence of some causal force that would be removed if the action stated in 0the proposition were taken. The reason is that there are other, equally plausible, inferences which can be made from the same data. For example, **policymakers** simply may not yet perceive a situation as a problem. Or they may have determined that the problem cannot be solved. Or they may have concluded that, on balance, solving the problem would bring about far worse consequences than the evils which would be removed. Each of these inferences, because it offers a different interpretation of reality, stands as an alternate hypothesis that must be defeated in order to provide a unique defense of the proposition. To defeat the alternatives, the affirmative will need to answer the causal question which is at the base of the analysis of inherency.

#### 3. Vote neg on presumption. Their own evidence concludes that lunar mining is happening anyway despite the OST’s ban. We can know with certainty the plan doesn’t solve because it’s literally already in force and the problem still exists.

## CP

### ISA Regulation

#### Text: States should create a binding international regulatory framework using the ISA model for property rights in outer space – standards as per the Chouhan card.

#### It competes – we permit private appropriation of outer space – and better solves the AFF

Chouhan 21

Karan Singh Chouhan, Privatization of Outer-Space and Ownership: ISA As a Model of Regulation for Resource Exploitation. *CMR University Journal for Contemporary Legal Affairs, Vol 1, Issue 2, ISSN 2582-4805* 19 Pages Posted: 3 May 2021 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3832673> -CAT

* ISA = International Seabed Authority
* CLOS = Convention on the Law of the Sea
* Bracketed to avoid gendered language

The emergence of private corporations in space exploration and their interest in space resource exploitation presents a challenge in front the international space law regime. It can be argued that the role of private space players can be positive as it can lead to more investment, research, innovation and commercialization which will benefit the [hu]mankind as a whole but at the same time unregulated commercialization or privatization of space may also lead to mayhem and creating a ‘wild-west’ in space with its militarization and such a scenario has to be avoided.67 Outer space is categorized as res-communes and a ‘heritage of mankind’ under the International Space Law. The concept of ‘heritage of mankind’ is not a new concept applied to outer space. This concept is already in use its application to the high seas and seabed where no nation can claim sovereignty over them as they belong to all of the mankind.68 There is a stark similarity between Oceans on earth and outer space as both cannot be appropriated as a whole and no country can claim them for itself. Considering that, it’s logical to learn from the lessons of 69 UNCLOS and applying these principles to the outer space for a 70 peaceful regulation of the exploitation activities. However, ‘Open Sea’ 71 concept gives the freedom of navigation and to exploit the fishing stocks in the high seas and thus such a principle cannot be applied in outer space for the reason that fish stocks are biological resources and can be replenished and same cannot be said about the outer space resources hence the analogy with Open ocean may fail. The model of International Seabed Authority (ISA) which regulates the deep seabed 73 mining and is the closest one that can be used to regulate the activities in space without creating friction and conflict. We have proven principle and legal theories in ISA which are working well and accepted by a large majority of countries, and there is a need to adopt these legal principles for the regulation of space resource exploitation. A. International Seabed Authority Model International Seabed Authority is established to regulate the use of seabed for resource extraction and mining. Like open ocean, the 74 seabed is also considered as the common heritage of mankind. Part XI 75 of UNCLOS also proclaims that no State can claim sovereignty over the seabed and all the rights over seabed belongs to mankind, and whose behalf the ISA will act. It further forbids the alienation of resource from 76 seabed, other than the authorization of the ISA, nor can any state claim any rights over the extracted resource unless it’s done according to the provisions of UNCLOS. The ISA fulfils its function of providing a 77 benefit to mankind by equitable sharing of financial and other economic benefits, and also, is instrumental in protecting the interest of the 78 developing countries by facilitating ‘transfer of technology’ so that even the poor countries can participate in resource extraction and such steps can lead to the development of mankind as a whole. Essentially, this model of resource extraction allows for the private appropriation, with the authorization of ISA, but with the condition that it leads to the sharing of the benefits as the resources are heritage of [hu]mankind. A 79 similar model, if applied in outer space can work as it provides the appropriate balance between several interests to keep militarization or conflict away but at the same time ensures that private entities have a role in the development of space frontiers as they can still keep heft amount of profit to themselves, while the benefits are getting shared among all the countries in an equitable manner. The Moon agreement also proposes the regulation model based on an equitable sharing of benefits and ISA is the best candidate to fulfill that condition. The ISA inspired 80 organization can work under the aegis of United Nations Committee on the Peaceful Uses of Outer Space (COPOUS) or it can be an independent body. Such an organization can provide charter-based rights for resource extraction from outer space and put a legal obligation on the basis of sharing the benefit, best proposal to recover and environmental regulation to prevent wastefulness. V. Conclusion We are living in a capitalistic era but it would be wrong to assume that it’s the ultimate economic ideology for human society. However, reality cannot be set aside for a hypothetical future, and the important role that private corporations can play in outer space cannot be denied. Unilateral action of US or any other country for privatization of outer space will only lead to conflict, even if we ignore that such actions are violating international law. It needs to be accepted that current legal regime is inadequate for the purpose of space resource exploitation as it lacks clarity. However, instead of unilateral action, a global governance model based on the principle of equity and ‘benefit of the [hu]mankind’ has to be developed. Space belongs to all of the mankind, it’s not a property 81 of one nation and hence state practice of one nation cannot decide the future for all of us. The Global governance model should be developed through international consensus, as the future of all the countries is at stake. In the 57th session of UNCOPUS held in 2018, one of the agenda of debate was consideration of potential legal model for activities in the exploration, exploitation and utilization of space resources. One of the 82 best potential models for the governance of outer space is the ISA, which has been discussed above. It is the best balance between exploitation of resources, respecting the role of private entities, but at the same time protecting the interest of the all of the mankind including developing and underdeveloped nations. Obviously, ISA cannot be transplanted as it is to the outer space and it has to be sui generis in nature, but outer space model of governance can be greatly inspired by the principle followed under ISA. Such a model can be the only way to ensure the International peace, prosperity and demilitarization of space.

#### It's feasible – I-law reaches a clear and enforceable consensus

O’Brien 19

Beyond UNISPACE: It’s time for the Moon Treaty by Dennis C. O’Brien Monday, January 21, 2019 The Space Review. <https://www.thespacereview.com/article/3642/1> -CAT

* We’ll also insert the graph of 157 countries in the doc; all light AND dark blue countries have adopted CLOS – that’s Europe, most of Africa and Asia, Australia, Canada, Mexico, and most of South America.

Many critics have compared the Moon Treaty with the United Nations’ Convention on the Law of the Sea (CLOS), claiming that the latter is a failed treaty that has prevented the development of undersea resources and fearing that the former would do likewise. They are especially critical of the creation of an “enterprise,” a government-owned entity that would use the development of undersea resources to assist countries that were adversely affected by undersea development. If the international regime envisioned by the Moon Treaty takes a form similar to that of the Enterprise, developed nations would be required to relinquish a portion of the resources extracted from the Moon and other celestial bodies. [5] Such concerns were very reasonable in the 1980s. At that time, many were insistent that governments should own and operate large industries rather relying on capitalism and private enterprise. Even the United States was requiring almost all satellites to be launched on the government-owned shuttle. All of that has changed, beginning with the Challenger accident in 1986. By 1991 the Soviet Union had ceased to exist and there was no longer a Cold War battle between capitalist and communist philosophies. The United Nations increased its efforts to broaden support for the CLOS, resulting in the Implementation Agreement (IA) in the early 1990s. The CLOS and its IA came into effect in 1994, one year after Guyana became the 60th country to adopt it. It has now been adopted by 157 countries (see map below). Even the United States almost adopted it. The CLOS had received bipartisan support in the Senate Foreign Relations Committee, but in 2012 34 senators signed a letter saying they would not vote for it, denying it the two-thirds majority needed for ratification. [6] There are now 29 entities who have signed contracts with the newly-created International Seabed Authority for exploration and possible development of seabed resources. [7] A treaty that was once thought dead was given new life through the use of an implementation agreement to address unresolved concerns.

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| map Fig. 1. Map of countries (in light/dark blue) that have adopted the U.N. Convention on the Law of the Sea. [8] |

The strategy of using of an additional document to make the five space treaties more universal gained support in the COPUOS legal subcommittee at their June conference: 13. The view was expressed that the universality of the five United Nations treaties on outer space should be strongly supported and promoted, and that effective implementation of the treaties required broad adherence due to the increasing number of parties holding a stake in outer space activities. 14. Some delegations expressed the view that the guidance document envisioned under thematic priority 2 of UNISPACE+50 (Legal regime of outer space and global governance: current and future perspectives) and developed within the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, could offer valuable guidance to States wishing to become a party to the five United Nations treaties on outer space and could thus help to promote the universality of those treaties, greater adherence to them and the progressive development of international space law. (emphasis added) [9]

#### **Enforceable consensus avoids the 1AC’s inevitable race to the bottom**

Tjandra 21

Tjandra, Jonathan. ‘The Fragmentation of Property Rights in the Law of Outer Space’. Air & Space Law 46, no. 3 (2021): 373–394. CAT

Concepts of property and appropriation derived from ancient legal doctrines are no longer sufficient to deal with the problems of scarcity and technology that arise from the context of outer space. But how to deal with this problem is a vexed question, for the international community is effectively in a Prisoner’s Dilemma. The current status quo is inadequate, primarily because of the uncertainty inherent in the provisions of the Outer Space Treaty, and because a right to use does not incentivize sustainable management of outer resources. However, a move to a more cooperative regime will be resisted by wealthier States, evidenced by the U.S’. reluctance to acknowledge the Moon Agreement. Similarly, a move to fully incorporate the full set of property rights would be resisted by poorer States, because it may mean they never will be able to benefit from outer space if the wealthier States utilize their right to exclude. The lack of consensus on an alternative means that there the international community is left with the least best option of a fragmented system of property rights.

#### That controls the internal link to every existential threat.

Mecklin 21

John Mecklin, Bulletin of the Atomic Scientists, “This is your COVID wake-up call: It is 100 seconds to midnight.” 2021 Doomsday Clock Statement, January 27, 2021. *Founded in 1945 by Albert Einstein and University of Chicago scientists who helped develop the first atomic weapons in the Manhattan Project, the*Bulletin of the Atomic Scientists *created the Doomsday Clock two years later, using the imagery of apocalypse (midnight) and the contemporary idiom of nuclear explosion (countdown to zero) to convey threats to humanity and the planet. The Doomsday Clock is set every year by the Bulletin’s Science and Security Board in consultation with its Board of Sponsors, which includes 13 Nobel laureates. The Clock has become a universally recognized indicator of the world’s vulnerability to catastrophe from nuclear weapons, climate change, and disruptive technologies in other domains.* <https://thebulletin.org/doomsday-clock/current-time/> -CAT

Humanity continues to suffer as the COVID-19 pandemic spreads around the world. In 2020 alone, this novel disease killed 1.7 million people and sickened at least 70 million more. The pandemic revealed just how unprepared and unwilling countries and the international system are to handle global emergencies properly. In this time of genuine crisis, governments too often abdicated responsibility, ignored scientific advice, did not cooperate or communicate effectively, and consequently failed to protect the health and welfare of their citizens. As a result, many hundreds of thousands of human beings died needlessly. Though lethal on a massive scale, this particular pandemic is not an existential threat. Its consequences are grave and will be lasting. But COVID-19 will not obliterate civilization, and we expect the disease to recede eventually. Still, the pandemic serves as a historic wake-up call, a vivid illustration that national governments and international organizations are unprepared to manage nuclear weapons and climate change, which currently pose existential threats to humanity, or the other dangers—including more virulent pandemics and next-generation warfare—that could threaten civilization in the near future. Accelerating nuclear programs in multiple countries moved the world into less stable and manageable territory last year. Development of hypersonic glide vehicles, ballistic missile defenses, and weapons-delivery systems that can flexibly use conventional or nuclear warheads may raise the probability of miscalculation in times of tension. Events like the deadly assault earlier this month on the US Capitol renewed legitimate concerns about national leaders who have sole control of the use of nuclear weapons. Nuclear nations, however, have ignored or undermined practical and available diplomatic and security tools for managing nuclear risks. By our estimation, the potential for the world to stumble into nuclear war—an ever-present danger over the last 75 years—increased in 2020. An extremely dangerous global failure to address existential threats—what we called “the new abnormal” in 2019—tightened its grip in the nuclear realm in the past year, increasing the likelihood of catastrophe. Governments have also failed to sufficiently address climate change. A pandemic-related economic slowdown temporarily reduced the carbon dioxide emissions that cause global warming. But over the coming decade fossil fuel use needs to decline precipitously if the worst effects of climate change are to be avoided. Instead, fossil fuel development and production are projected to increase. Atmospheric greenhouse gas concentrations hit a record high in 2020, one of the two warmest years on record. The massive wildfires and catastrophic cyclones of 2020 are illustrations of the major devastation that will only increase if governments do not significantly and quickly amplify their efforts to bring greenhouse gas emissions essentially to zero. As we noted in our [last Doomsday Clock statement](https://thebulletin.org/doomsday-clock/current-time/), the existential threats of nuclear weapons and climate change have intensified in recent years because of a threat multiplier: the continuing corruption of the information ecosphere on which democracy and public decision-making depend. Here, again, the COVID-19 pandemic is a wake-up call. False and misleading information disseminated over the internet—including misrepresentation of COVID-19’s seriousness, promotion of false cures, and politicization of low-cost protective measures such as face masks—created social chaos in many countries and led to unnecessary death. This wanton disregard for science and the large-scale embrace of conspiratorial nonsense—often driven by political figures and partisan media—undermined the ability of responsible national and global leaders to protect the security of their citizens. False conspiracy theories about a “stolen” presidential election led to rioting that resulted in the death of five people and the first hostile occupation of the US Capitol since 1814. In 2020, online lying literally killed. Considered by themselves, these negative events in the nuclear, climate change, and disinformation arenas might justify moving the clock closer to midnight. But amid the gloom, we see some positive developments. The election of a US president who acknowledges climate change as a profound threat and supports international cooperation and science-based policy puts the world on a better footing to address global problems. For example, the United States has already announced it is rejoining the Paris Agreement on climate change and the Biden administration has offered to extend the New START arms control agreement with Russia for five years. In the context of a post-pandemic return to relative stability, more such demonstrations of renewed interest in and respect for science and multilateral cooperation could create the basis for a safer and saner world. Because these developments have not yet yielded substantive progress toward a safer world, they are not sufficient to move the Clock away from midnight. But they are positive and do weigh against the profound dangers of institutional decay, science denialism, aggressive nuclear postures, and disinformation campaigns discussed in our 2020 statement. The members of the Science and Security Board therefore set the Doomsday Clock at 100 seconds to midnight, the closest it has ever been to civilization-ending apocalypse and the same time we set in 2020. It is deeply unfortunate that the global response to the pandemic over the past year has explicitly validated many of the concerns we have voiced for decades. We continue to believe that human beings can manage the dangers posed by modern technology, even in times of crisis. But if humanity is to avoid an existential catastrophe—one that would dwarf anything it has yet seen—national leaders must do a far better job of countering disinformation, heeding science, and cooperating to diminish global risks. Citizens around the world can and should organize and demand—through public protests, at ballot boxes, and in other creative ways—that their governments reorder their priorities and cooperate domestically and internationally to reduce the risk of nuclear war, climate change, and other global disasters, including pandemic disease. We have experienced the consequences of inaction. It is time to respond.

## DA

### China/He-3 DA

#### The private space industry is the only thing preventing Chinese dominance of outer space – they’ve already copied SpaceX’s innovations

Berger 21

Eric Berger, reporter, CNN. Why China's space program could overtake NASA, CNN.com April 1, 2021. Eric Berger, a reporter and editor based in Houston, is the author of ["LIFTOFF: Elon Musk and the Desperate Early Days that Launched SpaceX."](https://www.harpercollins.com/products/liftoff-eric-berger?variant=32126620205090) After a long career at the Houston Chronicle, he joined Ars Technica in 2015 as the site's senior space editor, covering SpaceX, NASA and everything beyond. He was a Pulitzer Prize finalist for his coverage of Hurricane Ike in the Houston Chronicle in 2008. <https://www.cnn.com/2021/04/01/opinions/china-space-race-us-spacex-berger/index.html> -CAT

China has a good chance of becoming the dominant space power in the 21st century, and it's not just looking to copy NASA on the way to the top. Instead, the country is paying close attention to what innovative US companies like SpaceX are doing as well. To get ahead in space, communism is learning from capitalism. In the summer of 2019, a small Chinese rocket launched from an inland spaceport in the southern part of the country. Close-up photos, posted afterward on Chinese social media accounts, showed small grid fins affixed to the upper part of this Long March 2C rocket for the first time. They were virtually identical in design to the grid fins SpaceX uses to steer its Falcon 9 rocket through the atmosphere for landings on its ocean-based drone ships. A year after this test, China's main space contractor revealed plans to develop the ability to reuse its Long March 8 booster, which is powered by kerosene fuel, the same type of power that fuels SpaceX rockets. By 2025, Chinese officials said, this rocket would be capable of landing on a sea platform like SpaceX's Falcon 9 booster. And it is not just the Chinese government contractors that are emulating SpaceX. A growing number of semi-private Chinese companies have also announced plans to develop reusable rockets. Chinese firms such as LinkSpace and Galactic Energy have released schematics that seem to mimic SpaceX technology. None of this should be particularly surprising. Government-launched enterprises in both Russia and Europe also recently revealed plans to develop reusable rockets that are similar both in appearance and function to the Falcon 9 booster. But what makes the Chinese efforts to emulate SpaceX particularly notable is the country's expansive ambitions in space and its vast resources to back up these long-term goals. Earlier this month, the Chinese government signed an agreement with Russia to work together to build a Moon base. China has also begun planning to launch crewed missions to Mars and deploy a massive space-based, commercial-scale solar power plant by 2050. They're playing the long game, and they're playing to win. Based on China's recent accomplishments in space, it would be wise to take these grand ambitions seriously. In December, China became only the third nation to return Moon rocks to Earth. Later this spring, it will seek to join the United States as only the second country to land and operate a rover on the surface of Mars. All the while, China is racing across a number of other fronts in space, from building an orbital space station to maturing anti-satellite capabilities in space to establishing a base on the moon. As China advances in space, NASA has spent more than $20 billion building a large rocket, the Space Launch System, that could soon be obsolete. And flying this single-use rocket is so expensive that, in combination with its Artemis program, NASA could exceed its congressional funds by more than 43%. NASA could also abandon the International Space Station in a few years. Meanwhile, China is training European astronauts and teaching them Chinese so that they might visit its large, modular space station. Some of these European astronauts may subsequently join the China-Russia lunar exploration effort. Increasingly, the US' main advantage over China lies in its burgeoning commercial space industry, led by SpaceX. If America wants to compete, it should unleash the full potential of SpaceX and other commercial space companies that seek to go further in space, faster and for less money. This kind of public-private partnership has already worked in low-Earth orbit, with NASA buying services from companies such as SpaceX, Northrop Grumman and Boeing to deliver cargo and astronauts to the International Space Station. This is one reason why, about five years ago, China began backing dozens of companies to commercialize rockets and satellites. The 21st century space race, therefore, is not so much between China and NASA. Rather, it is between China and the US commercial space industry. Astronauts relocated a spacecraft outside the International Space Station Astronauts relocated a spacecraft outside the International Space Station Nearly a decade ago, SpaceX attracted international acclaim when it began to successfully land its Falcon 9 rockets, accomplishing an engineering feat many previously deemed impossible or impractical. While historically rocket boosters have been discarded in the ocean after they expend their fuel on the way to orbit, SpaceX figured out how to land its boosters upright on platforms at sea and on land, allowing the company to recover and refurbish the rockets and save money. Later, the company strapped three of these Falcon 9 cores together to build a larger and much more powerful rocket, called the Falcon Heavy. And it is now testing an even larger, reusable booster, its Starship vehicle, intended to ferry humans to and from Mars. In late February, China unveiled strikingly similar space plans. The country's space agency said it would build a triple core rocket, which looks like a SpaceX Falcon Heavy. And it also confirmed plans to move forward with its titanic Long March 9 rocket, capable of lifting as much as 140 metric tons to low-Earth orbit, the same amount as the Saturn V rocket, an American super heavy-lift launch vehicle that remains the most powerful rocket that has ever flown successfully. This massive rocket would be unlike anything NASA built, however; Chinese officials, taking a page from the SpaceX playbook, said they would like it to be reusable. And, they added, they aim to one day launch the Long March 9 to take its taikonauts to Mars. While SpaceX became a transformational space company, the US and China have been locked in an increasingly intense battle for influence and economic resources on Earth. That conflict, which has already emerged in low-Earth orbit, will extend to the Moon and eventually Mars in the coming decades. In the contest for geopolitical influence and economic wealth, space will come to represent the ultimate high ground. China is definitely going. For now, the US and NASA have the advantage of a more robust space program and a stronger commercial space industry. But for the last decade, the US commercial space industry has succeeded despite Congress, not because of it. Unless Congress and NASA more closely embrace commercial space and follow a bold plan of exploration, China's constancy of purpose and mimicking of Western strengths will overcome this head start.

#### Chinese dominance would allow them to monopolize lunar Helium-3 and control the world’s economy.

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Richard B. Bilder, Foley & Lardner-Bascom Emeritus Professor of Law, University of Wisconsin Law School A LEGAL REGIME FOR THE MINING OF HELIUM-3 ON THE MOON: U.S. POLICY OPTIONS 33 Fordham Int’l L.J. 243 Fordham International Law Journal January, 2010 -CAT

A LEGAL REGIME FOR THE MINING OF HELIUM-3 ON THE MOON: U.S. POLICY OPTIONS During the past several years, the United States and three of the world’s other leading space powers, Russia, China, and India, have each announced their intent to establish a base on the Moon, in part with the purpose--or, in the case of the United States, at least the exploratory goal--of seeking to mine and bring to Earth helium-3 (“He-3”), an isotope1 of helium rarely found naturally on Earth but believed to be present in large amounts as a component of the lunar soil.2 The potential value of \*246 He-3 is that it is theoretically an ideal fuel for thermonuclear fusion power reactors, which could serve as a virtually limitless source of safe and non-polluting energy.3 For example, it is estimated that forty tons of liquefied He-3 brought from the Moon to the Earth--about the amount that would comfortably fit in the cargo bays of two current U.S. space shuttles--would provide sufficient fuel for He-3 fusion reactors to meet the full electrical needs of the United States, or one quarter of the entire world’s electrical needs, for an entire year.4 While the technological and economic feasibility of fusion-based nuclear energy, particularly fusion reactors utilizing He-3 \*247 as fuel, is still uncertain and contested, and its commercial realization at best decades away,5 the implications of such a development could be far-reaching and profound. Fusion energy could significantly reduce the world’s heavy dependence on fossil fuels, which are associated with environmental pollution, greenhouse gas emissions, and global warming--not to mention their rising price and role in recurrent geopolitical and economic tensions. Fusion energy could also provide a safer alternative to many countries’ growing reliance on energy generated from nuclear fission reactors, which hold the potential dangers of nuclear accidents, terrorism, weapons proliferation, and radioactive waste disposal. Moreover, in contrast to the prospect of depletion of terrestrial fossil fuels, it is estimated that there is sufficient He-3 present on the Moon to meet humanity’s rapidly growing energy needs for many centuries to come.6 Thus, despite the problematic future of He-3-based fusion energy, it is not surprising that the United States and other major powers are beginning to position themselves to ensure their future access to lunar He-3 resources. However, the growing interest in lunar He-3 poses its own problems. As yet, there is no international consensus on whether, or how, any nation or private entity can exploit or acquire title to lunar resources. The U.N.-developed 1967 Outer Space Treaty7 does not specifically address this question. The related U.N.-sponsored 1979 Moon Agreement8 purports to lay the groundwork for the eventual establishment of a regime for the exploitation of lunar resources, but that agreement has thus far been ratified by only a very few countries--not including the United States and none of which are currently leading space \*248 powers.9 Absent an agreed international legal framework, attempts by the United States or any other nation or private entity to acquire and bring to Earth significant quantities of He-3 could give rise to controversy and conflict. Indeed, without the security of an established legal regime, nations or private entities might well be reluctant to commit the very substantial money, effort, and resources necessary to mine, process, and transport back to Earth the amounts of lunar He-3 sufficient to support the broad-scale terrestrial use of He-3-based fusion energy. Consequently, it seems timely to revisit the issue of the legal regime potentially applicable to exploiting He-3 and other lunar resources.10 Part I of this Article will briefly discuss the technical \*249 and economic prospects for the development of He-3-based fusion energy. Part II lays out the present legal situation concerning the exploitation of lunar resources such as He-3. Part III analyzes whether it is prudent for the United States to seek an international lunar resource regime. Concluding that it would \*250 be, Part IV provides possible policy options for the United States concerning the establishment of an international legal regime capable of facilitating the development of He-3-based fusion energy. I. THE PROSPECTS FOR HE-3-BASED FUSION ENERGY11 He-3 is a component of the “solar wind” comprised of gas and charged particles continuously emitted by the sun into the solar system in the course of its thermonuclear fusion processes.12 During more than four billion years in which the solar wind has impacted the Moon, significant amounts of He-3, in addition to particles of other ionized components of the solar wind, have become embedded in the Moon’s regolith--the loose and dusty upper layer of rocks and soil comprising much of the Moon’s surface.13 While He-3 constitutes only a minute proportion of the lunar regolith,14 it is estimated that, altogether, there may be as much as one million metric tons of He-3 potentially recoverable \*251 from the Moon’s surface.15 This amount of He-3 is theoretically equivalent to ten times the energy content of all of the coal, oil, and natural gas economically recoverable on Earth.16 Since the Earth, unlike the Moon, possesses a magnetic field and atmosphere that deflect the solar wind, He-3 is rarely found naturally on Earth.17 The small amounts of He-3 available for research and experiment on Earth are derived principally from the decay of tritium used in thermonuclear weapons.18 While interest in lunar He-3 relates to its potential use as a fuel for thermonuclear power reactors,19 the technological and economic feasibility of fusion power itself has yet to be demonstrated.20 Unlike the engineering and material requirements for power production in the uranium and plutonium-fueled nuclear fission reactors now operating in the United States and a number of other countries, the generation of power by thermonuclear fusion requires the containment of ionized plasmas at extremely high temperatures, a feat not easily or economically achievable at present with existing materials and technology.21 Nevertheless, the enormous potential of fusion \*252 energy continues to spur persistent and intensive efforts to overcome these obstacles. One of the most significant efforts is the recent establishment, by a consortium of the European Union (through the European Atomic Energy Community), Japan, the People’s Republic of China, the Republic of India, the Republic of Korea, the Russian Federation, and the United States, of the International Thermonuclear Experimental Reactor (“ITER”),22 a large-scale, international experimental research project designed to explore the scientific and engineering feasibility of magnetic containment fusion power production.23 The program will be located in Cadarache, France, and is expected to cost over US$12 billion and continue for thirty years.24 For a number of reasons, including the limited terrestrial availability of He-3 and the very high temperatures required to achieve He-3-based fusion, most current research, and any first generation fusion power reactors, will likely be based on a fuel cycle involving the fusion of deuterium (“D”) and tritium (“T”), \*253 two isotopes of hydrogen available on Earth and capable of fusing at considerably lower temperatures.25 However, an He-3-D fuel cycle, if and when technically achievable, theoretically offers significant advantages as compared with the D-T fuel cycle. Unlike a D-T fusion reaction, which results in considerable neutron radiation, an He-3-D fusion reaction would produce little radioactivity and a substantially higher proportion of directly usable energy.26 More specifically, the comparative \*254 advantages of an He-3-D fuel cycle over a D-T fuel cycle would include: (1) increased electrical conversion efficiency; (2) reduced radiation damage to containment vessels, obviating the need for frequent expensive replacement; (3) reduced radioactive waste, with consequent reduced costs of protection and disposal; (4) increased levels of safety in the event of accident; and (5) potentially lower costs of electricity production.27 In particular, an He-3-D fuel cycle would significantly reduce the risk of nuclear proliferation because an He-3-D reaction, unlike a D-T reaction, would produce few neutrons and could not be readily employed to produce plutonium or other weapons-grade fissile materials.28 Consequently, interest in developing He-3-fueled thermonuclear energy is likely to continue. How would lunar He-3 be extracted and transported to Earth?29 Because the solar wind components are weakly bound to the lunar regolith,30 it should be relatively easy to extract them utilizing reasonable extensions of existing technology. In one proposed scenario, once a lunar base is established, robotic lunar mining vehicles fitted with solar heat collectors would: (1) traverse appropriate areas of the Moon’s surface--probably, in particular, the lunar maria, or “seas”--scooping up the loose upper layer of the lunar regolith and sizing it into small particles; (2) utilize solar energy to process and heat the collected regolith to the temperatures necessary to release, separate, and collect in a gaseous state the He-3, along with certain other solar-wind elements embedded in the regolith particles; (3) discharge the spent regolith back to the lunar surface; and (4) return with the collected He-3 and other gaseous byproducts to the lunar base.31 \*255 The collected He-3 gas could then be liquified in the lunar cold and transported to Earth, perhaps in remotely-operated shuttles.32 Importantly, this type of mining operation could result in the collection not only of He-3 but also significant amounts of hydrogen, oxygen, nitrogen, carbon dioxide, and water, all potentially very useful--indeed, perhaps indispensable--for the maintenance of a lunar base or further outer space activities such as expeditions to Mars or other planets.33 Since He-3 is believed to comprise only a small proportion of the lunar regolith, it will probably be necessary to process large amounts of lunar regolith in order to obtain the quantities of He-3 necessary to sustain a large-scale terrestrial He-3-based power program. However, the extraction of He-3 and other solar wind components from the lunar soil seems in itself unlikely to have a significant detrimental impact on the lunar environment because the regolith will be discharged back to the Moon’s surface immediately after processing.34 Whether the production of lunar He-3-based fusion power will prove commercially viable remains a complex and disputed question. The commercial success of such a development will clearly depend, among other things, on the parallel and integrated achievement of both economically efficient He-3-fueled fusion power reactors and a sustainable lunar mining enterprise capable of economically extracting and returning to Earth an assured supply of He-3 to fuel such reactors; neither is worth pursuing without the other. However, the development of He-3-based fusion need not start from scratch, but instead will likely build on the substantial research and investment already committed to the development of fusion power more generally in ITER and other already ongoing projects. Moreover, the development of lunar He-3 mining can similarly build on--and indeed form an additional rationale for--the already existing \*256 commitment of various space powers to establish lunar bases. As indicated earlier, lunar mining activities may be worth developing not only to extract He-3 from the regolith, but also to obtain a variety of other byproducts highly useful for the support of lunar bases.35 Finally, the economic viability of He-3-based fusion power will, of course, depend on its eventual production cost relative to alternative sources of energy such as fossil fuel or other conventional sources of energy, energy produced by nuclear fission reactors, or other forms of fusion energy--all figures difficult to accurately predict at this time. Proponents of He-3-based fusion energy argue that, notwithstanding the substantial costs involved in developing He-3 fusion reactors, establishing a lunar mining operation, and transporting He-3 back to Earth, He-3-based fusion power will eventually be more than competitive with the cost of other types of energy resources and provide more than sufficient incentive for the participation of both government and private enterprise.36 But other \*257 commentators are more skeptical, doubting both the technical feasibility of such a complex and challenging development and the likelihood of He-3-based fusion power ever competing successfully with more traditional Earth-based energy systems.37 Suffice it to say, major space powers currently consider the potential of He-3-based fusion energy sufficiently promising as to warrant their serious interest and to furnish at least an additional rationale for their commitment to programs to establish national stations on the Moon.

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