# 1N

## 1 - K

#### By framing outer space as an existential threat, the 1AC legitimizes militarized oppression

Peoples 10

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Buzan et al consequently argue that security, as a concept, is fundamentally about survival: it is when an issue is represented as posing an existential threat to the survival of a referent object. Here the term „referent object‟ can be defined simply as „that to which one can point and say, “It has to survive, therefore it is necessary to…”‟. 42 This is the same basic principle that underpins the conventional focus of national security and defence: war threatens the very existence of a referent object, the state. Within the concept of national security it is assumed that the state ”has to survive‟, therefore it is assumed that it is necessary for the state to maintain standing armies, weapons production and procurement, intelligence agencies and so on. One of the ways we can distinguish an existential threat, then, is the level of response it generates. When an issue is successfully presented as an existential threat, it legitimises the use of exceptional political measures. A classic (military) example in 9 international relations is a state‟s right to self-defence: if a state is under attack, it can legitimately use extraordinary measures that go beyond normal day-to-day politics. A state under attack can declare a state of emergency during which it suspends or changes its functions. It may declare martial law, for example, ration the provision of certain services, close roads and schools and so on. Commonly, the (discursive) identification of existential threats set in chain a number of effects that characterize the specific quality of security problems: urgency – the issue takes priority; and extraordinary measures – authorities claim powers that they would not otherwise have, or curtail rights and liberties that might otherwise apply. 43 On this basis, Buzan et al argue, the meaning of security is in many ways secondary to „the essential quality of security in general‟44 that resides in the act of saying „security‟ rather than in any essential meaning of the word: That quality is the staging of existential issues in politics to lift them above politics. In security discourse, an issue is dramatized and presented as an issue of supreme priority; thus, by labelling it as security, an agent claims a need for and a right to treat it by extraordinary means. 45 Threats and vulnerabilities can arise in many different areas, military and non-military, but to count as security issues they have to meet strictly defined criteria that distinguish them from the normal run of the merely political. They have to be staged as existential threats to a referent object by a securitizing actor who thereby generates endorsement of emergency measures beyond rules that would otherwise bind.46 In short, securitization is used in attempts to legitimate the application of extraordinary measures by positioning an issue as equivalent to with a threat to (military) national security as it is more traditionally understood. Waever argues that we can think of this process of securitization in terms of spectrum that runs from nonpoliticized (meaning that an issue is not a political issue), through politicised (meaning it is part of a public policy debate) to securitized (meaning that the issue is thought of as an existential threat and therefore justifies responses that go beyond normal political practices). The movement of an issue along the spectrum from „politicized‟ to „securitized‟ is initiated through what is known as a speech act: a securitizing speech act – or, „securitizing move‟ – occurs when an issue not previously thought of as a security threat come to be spoken of as a security issue by key political actors. As is noted by Buzan, Waever and de Wilde, „The obvious method [for the analysis of securitization] is discourse analysis, since we are interested in when and how something is established by whom as a security threat.‟47 This is particularly apposite to discussion of space security, where policy currently tends to lead practice, 48 and hence discursive constructions, and not just technical capabilities and space physics, are important when considering the prospects for international cooperation on the issue of space security.49 Rigidly interpreted, then, we might say that the application of a securitization framework to space policy involves an assessment of the extent to which outer space has become „securitized‟ within these policy discourses: that is, the degree to which the current use, access and dependence on outer space has become framed as an „existential threat‟ and has come to be accepted as such by a relevant audience.50 In methodological terms, Buzan, Waever and de Wilde in their original formulation of 10 securitization theory argue that securitizing moves will follow the „grammar‟ of security: that is, securitizing speech acts will present an issue in terms of threats and countermeasures to reduce or defeat identified threats.51 In turn, the members of the Copenhagen School, particularly Ole Waever, suggest a normative preference for „desecuritization‟ of issues: that is, in this case, the extent to which states and international organizations seek to move issues related to outer space into the „ordinary public sphere‟ of politicization rather than view them in terms of threats and countermeasures associated with securitization.52

#### The alt is to deconstruct the legitimacy of militaristic regimes – a powerful act that must come from below.

Cooper 06

University of Bradford International Relations and Security Studies Senior Lecturer [Neil, "Putting disarmament back in the frame," Review of International Studies, 2006, accessed 12-13-19]

However, it is also the case that the contemporary disarmament and broader arms limitation system is a highly asymmetric one geared to preserving the military hegemony of the US and its allies. Moreover, even the new arms limitation agenda is characterised by its own asymmetries. In particular, civil society has manifestly failed to gain the same level of influence over core military security issues - for example, NBC or the trade in major conventional weapons that keeps Western defence industries viable. In some respects then, this analysis shares certain commonalities with offensive realist critiques that emphasise the problematic nature of arms control theory (albeit from a different standpoint) and the supremacy of politics and power in determining the possibilities for the control of arms.86 One response, therefore, might be to adopt a similar attitude of resigned cynicism in the face of the overwhelming influence of power and interest in shaping discourse and practice - and to conclude that a truly emancipatory, as opposed to asymmetric, disarmament agenda is unrealisable. However, there are both material and ideational factors immanent in the contemporary international system that suggest a politics of radical emancipatory disarmament can be constituted. First, the success of existing disarmament initiatives - albeit under asymmetry - highlights the real-world relevance of disarmament proposals still dismissed as failed and utopian. This illustrates the potential for a more radical disarmament agenda to be realised by simultaneously deconstructing hegemonic framings of the arms limitation problem and developing alternative narratives that contain inherently transformatory meanings - a powerful political act in itself. Second, the influential role of global civil society in new arms limitation suggests the possibility of a truly progressive practice of arms limitation - a kind of disarmament from below.87 In particular, campaigns such as those on landmines or conflict diamonds demonstrate the (as yet unfulfilled) potential for networked and adaptive rhizomatic movements to envision and realise radical alternative security futures. This is not to deny the significant power differentials that exist between states and civil society movements that may themselves have different goals. However, the flexibility of such movements contrasts sharply with the rigid and sclerotic statist institutions most immediately geared to dealing with the diplomacy of arms limitation. Moreover, at their optimal, such swarming resistances to hegemony have the potential to exploit the uncontrollable spaces and flows of a networked information age88 to generate focused policy goals and shared understandings; to generate political and cultural power by exploiting global media tropes (Princess Diana as beatified saint opposed to landmines) or creating their own (diamonds as blood diamonds);89 to challenge both the threat discourses that underpin the arms dynamic and the counsels of despair in the face of anarchy and a supposed military technological imperative that lie at the heart of arms control theory; and to thus effect change by eroding the legitimacy of institutions and actors upholding militarism.90

#### The ROB is to endorse a discursive reorientation of debate in opposition to hegemonic security framing – vote neg, we acknowledge and refuse their rhetoric.

Burke 02

Anthony Burke, School of Political Science and International Studies, University of Queensland 2002 [Anthony, Alternatives 27] <https://www.jstor.org/stable/40645035?seq=1#metadata_info_tab_contents> -recut CAT

It is perhaps easy to become despondent, but as countless struggles for freedom, justice, and social transformation have proved, a sense of seriousness can be tempered with the knowledge that many tools are already available—and where they are not, the ef­fort to create a productive new critical sensibility is well advanced. There is also a crucial political opening within the liberal problematic itself, in the sense that it assumes that power is most effec­tive when it is absorbed as truth, consented to and desired—which creates an important space for refusal. As Colin Gordon argues, Foucault thought that the very possibility of governing was condi­tional on it being credible to the governed as well as the govern­ing. This throws weight onto the question of how security works as a technology of subjectivity. It is to take up Foucault's challenge, framed as a reversal of the liberal progressive movement of being we have seen in Hegel, not to discover who or what we are so much as to refuse what we are. Just as security rules subjectivity as both a totalizing and individualizing blackmail and promise, it is at these levels that we can intervene. We can critique the machinic frame­works of possibility represented by law, policy, economic regulation, and diplomacy, while challenging the way these institutions deploy language to draw individual subjects into their consensual web. This suggests, at least provisionally, a dual strategy. The first as­serts the space for agency, both in challenging available possibilities for being and their larger socioeconomic implications. Roland Bleiker formulates an idea of agency that shifts away from the lone (male) hero overthrowing the social order in a decisive act of re­bellion to one that understands both the thickness of social power and its "fissures," "fragmentation," and "thinness." We must, he says, "observe how an individual may be able to escape the discur­sive order and influence its shifting boundaries. ... By doing so, discursive terrains of dissent all of a sudden appear where forces of domination previously seemed invincible." Pushing beyond security requires tactics that can work at many-levels—that empower individuals to recognize the larger social, cul­tural, and economic implications of the everyday forms of desire, subjection, and discipline they encounter, to challenge and rewrite them, and that in turn contribute to collective efforts to transform the larger structures of being, exchange, and power that sustain (and have been sustained by) these forms. As Derrida suggests, this is to open up aporetic possibilities that transgress and call into question the boundaries of the self, society, and the international that security seeks to imagine and police. The second seeks new ethical principles based on a critique of the rigid and repressive forms of identity that security has heretofore offered. Thus writers such as Rosalyn Diprose, William Con­nolly, and Moira Gatens have sought to imagine a new ethical rela­tionship that thinks difference not on the basis of the same but on the basis of a dialogue with the other that might, allow space for the unknown and unfamiliar, for a "debate and engagement with the other's law and the other's ethics"—an encounter that involves a transformation of the self rather than the other. Thus while the sweep and power of security must be acknowledged, it must also be refused: at the simultaneous levels of individual identity, social order, and macroeconomic possibility, it would entail another kind of work on "ourselves"—a political refusal of the One, the imagination of an other that never returns to the same. It would be to ask if there is a world after security, and what its shimmering possi­bilities might be.

## 2 - CP

#### Text: States should create a binding international regulatory framework under the ISA 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]

#### **The internal net benefit is that an 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.

## 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.

Bilder 10

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.

#### That dominance becomes self-reinforcing and controls the I/L to every claimed existential threat

* Including climate change, asteroids, space colonization, nuclear war, and global warming.
* Private sector key – free market innovation is a key advantage the US has over China

Kwast 19

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Why is space so critical to the future? Space is powerful precisely because it benefits from the attributes and principles of a network. A network can deliver power, information, and goods from one node, or all nodes, at a fraction of the increase in cost per customer compared to a linear system. The post office is an example of a linear model. If you send a letter to 100 different people, you have to pay for 100 stamps. The Internet is an example of a networked model. If you want to send an email to 100 people you can send it at a fraction of the cost. Most of our terrestrial economies are modeled on linear design, driving up cost for every delivery to a new customer. A networked space infrastructure will always win the cost war against a linear terrestrial infrastructure. Consequently, the first civilization to build a robust networked space infrastructure will dominate the global economy of the 21st century. Space will be a multi-trillion-dollar market that will disproportionately benefit the first great power that builds a vibrant infrastructure there. Finishing second in this race means accepting defeat. Why is this the case? Whoever moves into a new marketplace first defines and sets the terms of that market. If America is first to build the infrastructure of space, its rule of law and values, including every human’s inherent right to life, liberty, and the pursuit of happiness, will underpin the marketplace. If China is first, its values will dominate. China continues to demonstrate a lack of regard for fair economic practices, the rule of law, human dignity, or liberty. From transportation, to energy, to information, to manufacturing goods and services, China’s strategy is to dominate the key engines of economic growth that have historically changed world power and it views space as the place to seize and grow that advantage. It’s well-accepted that technological advantage drives economic prosperity, and economic prosperity is essential to sustainable national security. Today, China is applying this principle with new technologies and a superior strategy in space. America, on the other hand, is so underinvested, it is relying on the Russians to launch its astronauts into space. Fortunately, there is a way out, but only if we wake up now. Most Americans are completely unaware that China has a plan to build manned labs both on the moon and on Mars. Nor are they aware that China has publicly announced its plans to build a nuclear powered space shuttle or its plan to begin mining asteroids by 2040. This isn’t science fiction. China is investing billions and has achieved some notable firsts including putting the first quantum satellite in orbit, operating a rover on the far side of the moon, and its simulated Mars habitat in the Gobi Desert. If China stays on its current path, it will deploy a power station in space that could begin generating energy before 2040. China will claim that such stations are for peaceful means only — beaming clean energy via lasers or microwaves to anyone on earth — but they could also be weapons. The same beams could be directed at nodes of the U.S. power grid or a military base with destructive effect. America has grown accustomed to holding its adversaries at risk anywhere in the world in hours. China is developing the capability to have a more sophisticated capability that can reach virtually any target in seconds. America has become complacent and mistakes its rapidly dissipating economic and military advantages as rights. The United States is making the same mistake that other fallen great powers have made. Namely, it is doubling down on the approach that made America successful in previous generations and discounting rising powers taking new approaches. While the U.S. government nibbles around the edges of game-changing technologies, the Chinese party-state is making huge investments in key areas to include: hypersonics, 5G, supercomputing, artificial intelligence, 3D-printing, quantum computing , and robotics. China is employing these and other leading-edge technologies in wholistic and new strategic ways that could render America a second-rate power. Most Americans, and many in Congress, have not had that broader picture painted. Congress is at a crossroads, but some of its members may not even know it. It is time to make a deliberate decision to compete with China or to surrender by default. While American companies are working on these new technologies (albeit in separate silos), real power lies in harnessing these technologies together from space in intentional and innovative ways to achieve a dominant competitive advantage. China is actively pursuing a plan to use space as the ultimate “high ground” to dominate the global economy and transform economic, military, and political power in its image. While the United States has used terrestrial based strategies to contain its adversaries in the past, China is positioning itself to surround the entire globe from space. The good news is that there is still a way to win. The United States can build on key competitive advantages: namely, superior cultures of creativity and innovation, rooted in an open society and a free market. The U.S. government should start with a vision that is both bigger than China’s and meaningful to America’s society and values. From there, it can write and implement a strategy that can secure the American way of life in this century and ensure the goods and promises offered by space are not dominated by a country disinterested in human freedom. The benefits of such a course of action would appeal to most Americans, and indeed most people, to include clean energy, ubiquitous and secure communications, protection from space objects like the “city killing” meteor that hit Russia, deterrence capabilities that will render nuclear weapons obsolete, ensure the survival of humanity through expansion, and even modifying the Earth’s weather using satellites to slow the effects of climate change.