# OFF

## 1 – 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.

#### External NB: I-Law 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.

## 2 – DA – He3

#### 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.

#### No, seriously, China is super bad – their dominance would be a recipe for an authoritarian hellscape of global war

Schuman 20

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What kind of superpower will China be? That’s the question of the 21st century. According to American leaders such as Secretary of State Mike Pompeo, China will be a rapacious authoritarian nightmare, intent on destroying democracy itself. Beijing, needless to say, doesn’t quite agree. Fortunately for those of us seeking answers to this question, China was a major power for long stretches of history, and the foreign policies and practices of its great dynasties can offer us insights into how modern Chinese leaders may wield their widening power now and in the future. Of course, Chinese society today is not the same as it was 100 years ago—let alone 1,000 years. But I’ve long been studying imperial China’s foreign relations, and clear patterns of a consistent worldview emerge that are likely to shape Beijing’s perceptions and projection of power in the modern world. China will not be a pacifist power In an address to the United Nations General Assembly in September, Chinese President Xi Jinping repeated Beijing’s oft-stated claim that it was committed to peaceful development, and there is a widely held view that Chinese emperors of the past generally eschewed the use of force. It is certainly true that the country’s dynasties enjoyed stable relations with some of their East Asian neighbors for extended periods of time—unlike in Europe, where competing monarchies were almost constantly at each other’s throats. Modern Chinese like to contrast brutal European colonial adventures with the 15th-century voyages of Chinese Admiral Zheng He and his treasure fleets, which sailed across the Indian Ocean but conquered no one. But this quaint picture of Chinese pacifism ignores that the country’s dynasties were almost constantly at war. Sure, many of these wars were defensive, mainly against a panoply of invading northern tribesmen. But at the height of their power, the emperors were quite aggressive expansionists, too. The Han dynasty (206 B.C.–220 A.D.) and the Tang dynasty (618–907) had armies marching from Central Asia to the Korean peninsula. The Song dynasty (960–1279) fought wars with and sought territory from rival states; it just wasn’t very good at it. The most acquisitive of the dynasties was the Qing (1644–1912), which carved up and controlled Tibet and conquered today’s Xinjiang. The Qing emperors were Manchu, a northern people, but lands they acquired are now considered indisputable parts of the motherland. (Mao Zedong’s People’s Liberation Army had to reclaim Tibet, which had drifted away from China amid the chaos of the Qing collapse, while the Xinjiang region, which had attained a high degree of autonomy, had to be reintegrated as well.) China will insist on its own world order The states China didn’t or couldn’t overrun were absorbed into the Chinese world through a system of diplomacy and trade that the emperors controlled. Other governments were expected to pay tribute to the Chinese court as an acknowledgment of Chinese superiority, at least ceremonially, and the emperors then considered them vassals. Whether such a tribute system really existed as a hard-and-fast or consistently applied foreign policy is debated among historians. But it is clear that the Chinese usually tried to foist their diplomatic norms and practices onto those who desired formal relations with China. Think of it as the rules of the game of foreign affairs in East Asia, dictated by China. This order was rarely challenged, at least by the more established East Asian states. Unlike Europe, where states of roughly similar muscle contended for territory, trade, and influence, China had no real rivals. Generally speaking, its neighbors accepted Chinese dominance and followed its rules of engagement. When China faced a challenge, however, it could resort to force. The short-lived Sui dynasty (581–618) and the Tang spent decades, for example, trying to destroy the strong Koguryo kingdom in Korea. Zheng He, the supposedly peaceful admiral, launched a military expedition on the island of Sumatra (now part of Indonesia) against a rival to the local king and Chinese vassal. When the Japanese invaded the Korean peninsula in 1592, the Ming dynasty (1368–1644) sent troops to help the Koreans expel them. As late as the 1880s, the Qing dynasty went to war to aid its Vietnamese tributaries against the French. The Chinese would also police their system in other, coercive ways—by, for instance, denying proper trading rights to unruly foreigners. So while Xi told the UN in September that Beijing “will never seek hegemony, expansion, or sphere of influence,” history suggests that China will use force or coercion against other countries when they contest Chinese power. This has implications for Vietnam and other Southeast Asian countries that dispute China’s claim to nearly all of the South China Sea, and for Taiwan, which Beijing sees as a renegade province. There are also signs that the Chinese will restore aspects of the old imperial order as their power expands. On two occasions, Xi has summoned high-level delegations from countries participating in his infrastructure-building Belt and Road Initiative to pomp-heavy Beijing forums—tribute missions in all but name. Conversely, when countries defy Beijing’s edicts, they are denied access to its bounty. China blocked imports from Canada and Australia amid recent diplomatic tussles, and Beijing targeted South Korean businesses in China three years ago after Seoul agreed to deploy a U.S. missile defense system that the Chinese saw as a security threat. Chinese police officers watch a cargo ship at a port in Qingdao in China's eastern Shandong province. (AFP / Getty) China will export its values One reason supporting the notion that China will be a benign superpower is the amorality of its current foreign policy. Unlike the U.S., with its missionary zeal to bring its form of liberty to all, China doesn’t seem as interested in changing the world, this argument goes, just making money from it. There is some truth to this. The Chinese are equally happy to sell Huawei 5G networks to autocratic Russia and democratic Germany without a fuss. Historically, though, the Chinese believed that their culture had a transformative power—it could change barbarism into civilization. Confucius himself thought so. In the Analects, China’s greatest sage expressed a desire to live among barbarian tribes. A startled listener asked how he could tolerate their uncouth habits. Not to worry, Confucius answered. “If a superior man dwelt among them, what rudeness would there be?” Practically speaking, China’s historic statesmen didn’t really expect the world to “go Chinese,” but they did promote their civilization. Ceremonies for visiting ambassadors at the imperial court were designed to awe. Tang officials built dormitories for foreign students who wanted to study Chinese literature at the country’s famous academies. The voyages of Zheng He were meant most of all to display Chinese greatness: The Ming emperor who launched them, Yongle, imagined that the people of Cochin in southern India “went down on their hands and knees,” and, “looking to Heaven, they bowed and all said: ‘How fortunate we are that the civilizing influences of the Chinese sages should reach us.’” The Chinese also understood the link between culture and power. Other peoples naturally looked to China, the most advanced society in East Asia, when building their own kingdoms, and they liberally borrowed legal codes and governing institutions, artistic and literary styles, and, most famously, Chinese written characters. This common cultural bond sustained Chinese influence in the region even when the country itself was politically weakened. Xi knows this full well, and he intends to build up China’s soft power by pushing Chinese values, both old and new. “Facts prove that our path and system … are successful,” he once said. “We should popularize our cultural spirit across countries as well as across time and space, with contemporary values and the eternal charm of Chinese culture.” This is the purpose of Confucius Institutes, a state-run program aimed at promoting Chinese language and culture. In the wake of Beijing’s (supposedly) superior coronavirus-busting effort, Chinese officials and state media outlets have been relentlessly marketing their (authoritarian) governance system as superior, while denigrating the (democratic) U.S. by mocking its pandemic response. The implication of this is that modern China will prefer other countries to be more like them, not unlike the emperors of old. In imperial times, China’s rulers tended to favor foreigners who were “more Chinese.” In the first century A.D., the Chinese historian Ban Gu developed the concept of an “inner” world—comprised of societies touched by Chinese civilization—and an “outer,” of incorrigible barbarians who remained blind to China’s light. The inner crowd was treated more benignly and participated more closely in Chinese affairs. This suggests that ultimately China will support like-minded (read: authoritarian) regimes. Indeed, it already does: It befriends illiberal governments shunned by most other countries, such as North Korea, Iran, Belarus, and Venezuela. China only tolerates relationships it can dominate Even in deep antiquity, the Chinese considered themselves better than other peoples because they believed that their civilization was civilization. This formed the basis of a worldview in which the Chinese sat atop the hierarchy. They did not believe in equal relationships, at least in official or ideological terms. Their world order, with its rules and norms, was based on the principle of Chinese superiority, and the acceptance of that superiority by all others. Traditionally, when the Chinese were forced into a subordinate or even an equal position with another power, usually due to military weakness, they resented it and tried to reassert their usual dominance when they were strong enough to turn the tables. And it is happening again today. Seething at what they consider humiliations inflicted by Western powers—from the Opium War to what the Chinese call “unequal” treaties that sapped their sovereignty—China is on a mission to regain the upper hand. As Xi put it, the country “will never again tolerate being bullied by any nation.” That’s the goal behind much of his current policies, from a significant buildup of military capabilities to state-funded programs aimed at helping China overtake the West in technology. More and more, China’s diplomacy turns threatening when faced with challenges from other countries, whether the U.S., India, or Australia. What becomes clear from an examination of China’s history is that the Chinese don’t just want to be a great power—they believe they deserve to be. In centuries past, the Chinese thought their sovereign had a right to rule “all under Heaven.” Due to the realities of technology and distance, China’s reach usually remained regional. But now, in the age of globalization, Beijing’s influence may achieve that lofty goal.