### Framing

#### The standard is maximizing expected wellbeing.

#### 1] Pleasure and pain are the only intrinsic values and all other values boil down to them

Moen 16, Ole Martin [PhD, Research Fellow in Philosophy at University of Oslo]. “An Argument for Hedonism”; June, 2016; *Journal of Value Inquiry* [https://link.springer.com/article/10.1007/s10790-015-9506-9]

Let us start by observing, empirically, that a widely shared judgment about intrinsic value and disvalue is that pleasure is intrinsically valuable and pain is intrinsically disvaluable. On virtually any proposed list of intrinsic values and disvalues (we will look at some of them below), pleasure is included among the intrinsic values and pain among the intrinsic disvalues. This inclusion makes intuitive sense, moreover, for there is something undeniably good about the way pleasure feels and something undeniably bad about the way pain feels, and neither the goodness of pleasure nor the badness of pain seems to be exhausted by the further effects that these experiences might have. “Pleasure” and “pain” are here understood inclusively, as encompassing anything hedonically positive and anything hedonically negative. 2 The special value statuses of pleasure and pain are manifested in how we treat these experiences in our everyday reasoning about values. If you tell me that you are heading for the convenience store, I might ask: “What for?” This is a reasonable question, for when you go to the convenience store you usually do so, not merely for the sake of going to the convenience store, but for the sake of achieving something further that you deem to be valuable. You might answer, for example: “To buy soda.” This answer makes sense, for soda is a nice thing and you can get it at the convenience store. I might further inquire, however: “What is buying the soda good for?” This further question can also be a reasonable one, for it need not be obvious why you want the soda. You might answer: “Well, I want it for the pleasure of drinking it.” If I then proceed by asking “But what is the pleasure of drinking the soda good for?” the discussion is likely to reach an awkward end. The reason is that the pleasure is not good for anything further; it is simply that for which going to the convenience store and buying the soda is good. 3 As Aristotle observes: “We never ask [a man] what his end is in being pleased, because we assume that pleasure is choice worthy in itself.”4 Presumably, a similar story can be told in the case of pains, for if someone says “This is painful!” we never respond by asking: “And why is that a problem?” We take for granted that if something is painful, we have a sufficient explanation of why it is bad. If we are onto something in our everyday reasoning about values, it seems that pleasure and pain are both places where we reach the end of the line in matters of value

#### 2] Governments must deal with differing theories by maximizing well being

Woller 97, Gary [BYU Professor]. “An Overview by Gary Woller”; June, 1997; *A Forum on the Role of Environmental Ethics*

Moreover, virtually all public policies entail some redistribution of economic or political resources, such that one group's gains must come at another group's ex- pense. Consequently, public policies in a democracy must be justified to the public, and especially to those who pay the costs of those policies. Such justification cannot simply be assumed a priori by invoking some higher-order moral principle. Appeals to a priori moral principles, such as environmental preservation, also often fail to acknowledge that public policies inevitably entail trade-offs among competing values. Thus since policymakers cannot justify inherent value conflicts to the public in any philosophical sense, and since public policies inherently imply winners and losers, the policymakers' duty [is] to the public interest requires them to demonstrate that the redistributive effects and value trade-offs implied by their polices are somehow to the overall advantage of society. At the same time, deontologically based ethical systems have severe practical limitations as a basis for public policy. At best, a priori m oral principles provide only general guidance to ethical dilemmas in public affairs and do not themselves suggest appropriate public policies, and at worst, they create a regimen of regulatory unreasonableness while failing to adequately address the problem or actually making it worse. For example, a moral obligation to preserve the environment by no means implies the best way, or any way for that matter, to do so, just as there is no a priori reason to believe that any policy that claims to preserve the environment will actually do so. Any number of policies might work, and others, although seemingly consistent with the moral principle, will fail utterly. That deontological principles are an inadequate basis for environmental policy is evident in the rather significant irony that most forms of deontologically based environmental laws and regulations tend to be implemented in a very utilitarian manner by street-level enforcement officials. Moreover, ignoring the relevant costs and benefits of environmental policy and their attendant incentive structures can, as alluded to above, actually work at cross purposes to environmental preservation. (There exists an extensive literature on this aspect of regulatory enforcement and the often perverse outcomes of regulatory policy. See, for example, Ackerman, 1981; Bartrip and Fenn, 1983; Hawkins, 1983, 1984; Hawkins and Thomas, 1984.) Even the most die-hard preservationist/deontologist would, I believe, be troubled by this outcome. The above points are perhaps best expressed by Richard Flathman, The number of values typically involved in public policy decisions, the broad categories which must be employed and above all, the scope and complexity of the consequences to be anticipated militate against reasoning so conclusively that they generate an imperative to institute a specific policy. It is seldom the case that only one policy will meet the criteria of the public interest (1958, p. 12). It therefore follows that in a democracy, policymakers have an ethical duty to establish a plausible link between policy alternatives and the problems they address, and the public must be reasonably assured that a policy will actually do something about an existing problem; this requires the means-end language and methodology of utilitarian ethics. Good intentions, lofty rhetoric, and moral piety are an insufficient though perhaps at times a necessary, basis for public policy in a democracy.

#### 3] Util is a lexical prerequisite to other theories. Threats to bodily harm preclude decision making, preventing actors from utilizing other theories. Thus, util comes first.

#### 4] Util is key to justice since it gives an equal weight to all. Other theories only favor those directly harmed.

### Adv 1: Space Weaponization

#### Governments will weaponize outer space to protect private space ventures.

Finkelstein 18, Claire [Algernon Biddle Professor of Law and Professor of Philosophy]. “Trump risks leading the world into a space arms race”; August 28, 2018; *The Hill* [https://thehill.com/opinion/national-security/402640-trump-risks-leading-the-world-into-a-space-arms-race]

A motive might be sought in the potentially profitable commercial ventures in outer space, such as asteroid mining, for which the president has voiced support. The president may imagine that a Space Force is the way to gain control over and protect the valuable assets involved. However, this way of thinking is risky. Currently, outer space is “militarized” but not yet “weaponized.” Militaries around the globe make heavy use of satellite technology — such as surveillance and global positioning — but so far they have refrained from placing weapons on satellites in outer space or using them directly for warfighting. The administration’s ad hoc push for space dominance risks upsetting a delicate balance: space now hovers precariously at the brink of weaponization and it would take only one major country defecting from the current system of peaceful self-constraint to drive us into a major arms race in outer space. The current peaceful equipoise is largely because of the remarkable success of the 1967 Outer Space Treaty, an international agreement with which more than 100 signatory countries have been compliant. Under this treaty, space is considered a “province of mankind” that is not owned or controlled by any single nation. Article IV of the treaty provides that celestial bodies be used “for peaceful purposes only,” and objects in orbit carrying nuclear or weapons of mass destruction are strictly prohibited. Article II of the treaty makes clear that outer space “is not subject to national appropriation by claim of sovereignty.” Seeking military dominance in space, coupled with encouraging appropriation of space for commercial purposes, puts us at loggerheads with our traditional allies, upsets stable and well-established treaty obligations, and moves the world closer to a highly dangerous arms race in outer space. It is important to distinguish the idea of a Space Force from the pursuit of military and economic superiority in space. There may not be anything intrinsically wrong with the idea of a Space Force, or in somewhat more moderate form, a “Space Corps,” similar to the Marine Corps, or a “Space Command,” as Congress has called for in the 2019 National Defense Authorization Act, which President Trump signed into law last Monday. The merits of a stand-alone space unit depend on how its mission is conceived and how it fits into broader U.S. policy objectives in outer space, but a thoughtful, coherent and measured inter-agency space policy has yet to emerge. The danger comes from the aim of dominance, not the particular way in which dominance is sought. In addition to potentially touching off an arms race of planetary proportions, there could be an economic race over space resources, comparable to the emerging fight over the Arctic or over deep-sea fishing rights. The combination of space weaponization and space commercialization easily could thrust us into a new cold war (or worse). A hot war in outer space is unthinkable, and we cannot let it occur.

#### Furthermore, governments and private space companies are intertwined

Salazar 18, Juan A. Ortiz [Double major in Materials Engineering and Political Science at Cal Poly San Luis Obispo]. “Space Privatization, Colonization, and Militarization: A New Frontier for International Law”; 2018; *Paideia Volume 5* [https://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1101&context=paideia]

On the surface, space exploration may appear to be dominated by private and public companies, like SpaceX and Aerojet Rocketdyne, NASA, and officials such as the US president, but the truth is space endeavors, plans, and technologies are manipulated by federal agencies that receive little limelight by news sources. The Department of Defense (DOD) alone manages “launch vehicle development, communications satellites (or GPS), early warning satellites weather satellites, reconnaissance satellites, and developing capabilities to protect U.S. satellite systems and to deny the use of space to adversaries (called ‘space control’ or ‘counterspace systems’).”14 Whatever domestic and foreign services satellites and the Space Program may provide, the DOD appears to be intricated. Space privatization, colonization, and militarization have advanced from discourse on races and cooperation between private companies and government agencies to planned missions and other objectives, such as the weaponization of space.

#### Space weaponization risks nuclear war

Graham 05, Thomas [Served for nearly three decades at the U.S. Arms Control and Disarmament Agency]. “Space Weapons and the Risk of Accidental Nuclear War” Dec, 2005; *Arms Control Association* [https://www.armscontrol.org/act/2005-12/features/space-weapons-risk-accidental-nuclear-war]

Obviously, nothing should be done in any way further to diminish the reliability of the space-based components of U.S. and Russian ballistic missile early warning systems. A decline in confidence in such early warning systems caused by the deployment of weapons in space would enhance the risk of an accidental nuclear weapons attack. Yet, as part of its plans for missile defense, the Pentagon is calling for the development of a test bed for space-based interceptors as well as examining a number of other exotic space weapons. In an interview published in Arms Control Today, Lt. Gen. Henry Obering, director of the Missile Defense Agency, touted what he said was “a very modest and moderate test-bed approach to launch some experiments.” Obering said the Pentagon would only deploy a handful of interceptors: “We are talking about onesies, twosies in terms of experimentation.”[2] Despite Obering’s claims, however, establishing a test bed for missile defense in space, as opposed to current preliminary research, would be a long step toward space weaponization. Once space-based missile defenses are tested, they are likely to be deployed, and in significant numbers, no matter if the tests are successful. To see the path that a space test bed is likely to follow, one need only look at the present ground-based program: the Pentagon claims there is little true difference between a test bed and an operational deployment. Moreover, in space the deployment could be more dramatic. Although the current ground-based configuration envisions a few dozen interceptors, continuous space coverage over a few countries of concern would likely require a very large number of interceptors because a particular interceptor will be above a particular target for only a few minutes a day. Today’s missile defenses provide very little real protection as the United States currently faces no realistic threat of deliberate attack by nuclear-armed long-range missiles. But space weapons could actually be detrimental to U.S. national security. They would increase the perceived vulnerability of early warning systems to attack and cause Russia and perhaps other countries such as China to pursue potentially destabilizing countermeasures, such as advanced anti-satellite weapons. These dangers would be particularly worrisome for those components that are placed in geosynchronous orbits (GEO). Space objects in GEO are sufficiently far from the Earth (about 36,000 kilometers) so that their speed roughly matches the rotational speed of the Earth and they remain “stationary” above one location. To be sure, any country that can place a satellite in these farther orbits—and there are several—could potentially threaten another country’s satellites there. Yet, it would be easier to do so, and perhaps more importantly, the threat perception would be greater with weapons based in space than with existing ground-based technology. The 15 U.S. early warning satellites are almost entirely in GEO. The three functioning Russian early warning satellites utilize two different orbits. Two of the satellites use a highly elliptical orbit, which ranges from low-Earth orbit (LEO)—100 to 2,000 kilometers above the Earth where space objects travel at about 8 kilometers per second—out to GEO. The other satellite is permanently stationed in GEO. Moreover, a space arms competition could hinder the flow of satellite imagery that can be used to track activities that might reveal programs to develop weapons of mass destruction in countries of concern. For example, activities detected through space-based collection systems can be used to trigger requests for inspections pursuant to the Chemical Weapons Convention (CWC) (implicitly) or the Comprehensive Nuclear Test Ban Treaty (explicitly), should that treaty be brought into force. It is important in this respect to recall that the suspicions that Israel and South Africa may have conducted an atmospheric nuclear test in 1979 were driven by readout from a U.S. VELA satellite. Similarly, the United States has benefited from the revolution in national intelligence that began with and is based on photographic reconnaissance satellites and related systems, which has helped bring to an end the worst-case analysis and close calls with nuclear war that existed throughout the Cold War. If a truly peaceful and stable world order is ever achieved, the advent of this technology beginning in the late 1950s will be regarded by future generations as a major historical turning point. These are crucial efforts that must never be allowed to be disrupted, either by space-based weapons or with the relatively simplistic ground-based anti-satellite weapon systems that could today be deployed. The United States has considerable anti-satellite weapons capability. An F-15-based homing vehicle system was successfully tested in the 1980s, and the anti-ballistic missile system currently being deployed in Alaska and California has an inherent anti-satellite capability. Right now, no other country is developing a counterspace system, although the Soviet Union successfully tested a co-orbital anti-satellite system in the 1970s and 1980s and Russia and China are believed to be capable of doing so. Notably, 28 countries have ballistic missiles that can reach LEO satellites, and all have the technical capability to develop a LEO anti-satellite system by modifying these missiles. Active defenses—the deployment of devices intended to deflect, destroy, or render unworkable offensive systems—cannot by themselves be expected to provide adequate protection of space assets either now or in the long term. These technologies, as well as hardening and other passive means of defense, may provide some means of defending against the current generation of anti-satellite technology. Eventually, however, our would-be attackers would find ways to counter those defenses. Thus, it would appear that an agreed legal regime, predicated on mutually beneficial and, of course, verifiable restraint, should at least be considered. Protecting Early Warning Systems Rather than building space weapons, it may be best to put space off-limits for arms. Domestic law in major spacefaring countries around the world could prohibit programs for developing space-based weapons. To reinforce this effort, there could be a worldwide understanding that placing weapons in space or further developing existing anti-satellite weapons capability is contrary to international law and thereby a basis for economic and political pressure and punitive sanctions by a united world community. The best way to accomplish these twin objectives is by the development and negotiation of an international treaty on space weapons and anti-satellite weapons. Treaties become domestic law when ratified, and they can establish worldwide norms of behavior. The Outer Space Treaty of 1967 is included in a unique class of arms control agreements sometimes referred to as nonarmament treaties. These agreements were intended to prevent and have been successful in preventing the deployment of weapons in areas where they have not previously been present. Today, after more than three decades, space remains free of weapons of mass destruction thanks to the Outer Space Treaty. Pursuant to the initiative of President Dwight Eisenhower, who at the time of his establishment of NASA made it clear that it was U.S. policy to keep space weapons-free, space remains free of weapons of all kinds. Space has long been militarized—early warning systems are military systems—but it has never been weaponized. This policy has served us well for decades, and there is a strong burden of persuasion on any who argue that it should be changed. It was asserted during the administrations of George H. W. Bush and Bill Clinton that there was no need for limitations beyond the existing Outer Space Treaty as no arms race or threat of an arms race in space existed. The Eisenhower policy held in the United States and was supported everywhere else. Consistent with the Bush-Clinton position, over the years, the United States routinely opposed the creation of a negotiating mandate for outer space at the Conference on Disarmament in Geneva. A number of years ago, a more formal effort began in Geneva and New York called Prevention of an Arms Race in Outer Space (PAROS). The United States did not support this, abstaining from voting on the resolution in the UN General Assembly each year. And this year it voted no. Moreover, the standard argument for continuance of the Bush-Clinton position is no longer valid in the wake of the January 2001 report of the Rumsfeld space commission, which declared that a serious risk existed of a “ Pearl Harbor in space.” It has been suggested that a legal regime to prevent the weaponization of space could be crafted simply by expanding or building on the Outer Space Treaty. There may be some merit to this notion, especially considering that the treaty has more than 90 states-parties. However, the subject is complicated, and there are many important interests to protect in addition to space assets for early warning and for intelligence and verification such as remote sensing, telecommunications, navigation, and the enhancement of ground-based military capabilities. An expanded Outer Space Treaty could include first and foremost a prohibition on all weapons in space, both offensive and defensive, as they are not distinguishable. “Weapon” would have to be defined for the purposes of this treaty so as to exclude space objects with a peaceful purpose and items that are not relevant to the objective of preventing space weaponization. Also, space objects designed to support terrestrial military operations such as the Global Positioning System maintained by the U.S. Air Force should be explicitly permitted. Some kind of inspection of payloads of space launches would be necessary, perhaps modified by the principle of “managed access” as found in the CWC. Provisions on transparency of space activities and on information sharing would be required. These amendatory provisions could be negotiated in a separate stand-alone protocol to reduce somewhat the risk of reopening other provisions of the Outer Space Treaty. Some have argued that it is premature to consider additional legal obligations in space, that informal “rules of the road” would get far more support. Others argue that the United States must resist the call for any new international legal obligations inhibiting the deployment of weapons in space. It is asserted that any such agreement or arrangement would be unenforceable and unverifiable and that “the ignominious record of enforcing and verifying treaties prohibiting activities on Earth is proof enough to give pause to any conversation about a treaty governing activities in space.”[3] Yet, where would we be without the nuclear Nonproliferation Treaty? Likely, more than 40 states would be armed with nuclear weapons, meaning that every conflict would run the risk of going nuclear, and nuclear weapons would be so widespread it would be impossible to keep them out of the hands of terrorist organizations. Where would we be without the strategic arms limitation and reduction agreements of the 1970s, 1980s, and 1990s? Likely, the United States and Russia would have so many nuclear weapons and long-range ballistic missiles, they could never be controlled. Where would we be without the Outer Space Treaty? Nuclear weapons could be orbiting the Earth with the capability to strike anywhere, anytime without warning. Where are we now in the wake of the dissolution of the Anti-Ballistic Missile (ABM) Treaty? We possibly could be on the verge of actively considering the development and deployment of space-based ABM systems that would address no current or foreseeable threat but could unhinge strategic stability.

#### Nuclear war causes extinction

CBS Denver 14, “Study: ‘Small’ Nuclear War Would Destroy The World”; March 26, 2014; *CBS* [https://denver.cbslocal.com/2014/03/26/study-small-nuclear-war-would-destroy-the-world/]

DENVER (CBS4) – With an estimated 17,000 nuclear weapons in the world, we have the power to exterminate humanity many times over. But it wouldn’t take a full-scale nuclear war to make Earth uninhabitable, reports Live Science. Even a relatively small regional nuclear war, like a conflict between India and Pakistan, could spark a global environmental catastrophe, says a new study. “Most people would be surprised to know that even a very small regional nuclear war on the other side of the planet could disrupt global climate for at least a decade and wipe out the ozone layer for a decade,” said lead author Michael Mills, an atmospheric scientist at the National Center for Atmospheric Research in Colorado. Researchers developed a computer model of the Earth’s atmosphere and ran simulations to find out what would happen if there was a nuclear war with just a fraction of the world’s arsenal. What they saw was the stuff of nightmares: Firestorms would belch over 5 million tons of ash into the sky. The ash would absorb the sun’s rays, causing deadly cooling on the surface. Global temperatures would plummet by nearly 3 degrees Farenheit on average, with most of North America experiencing winters that would be colder by 4 to 10 degrees. Lethal frosts would cover the Earth and reduce the growing seasons by about a month for several years. Rainfall and other precipitation would be reduced by about 10 percent, triggering worldwide droughts and leading to wildfires in the Amazon, which would spew more smoke into the atmosphere. The sky ash would heat the stratosphere and accelerate the chemical reactions that destroy the ozone layer. The intense ultraviolet radiation that would get through to the surface would be a dramatic threat to human health and damage fragile ecosystems on land and sea. “All in all, these effects would be very detrimental to food production and to ecosystems,” Mills said.

### Adv 2: Debris

#### Privatization of space is unsustainable and increases debris – triggers the Kessler Syndrome

Thompson 21 [Clive, 11/17/21, Clive Thompson is a contributing writer for the New York Times Magazine, a columnist for Wired and Smithsonian magazines, and a regular contributor to Mother Jones. He’s the author of Coders: The Making of a New Tribe and the Remaking of the World, and Smarter Than You Think: How Technology is Changing our Minds for the Better. He’s @pomeranian99 on Twitter and Instagram, “Get Ready for the “Kessler Syndrome” to Wreck Outer Space,” OneZero, <https://onezero.medium.com/get-ready-for-the-kessler-syndrome-to-wreck-outer-space-7f29cfe62c3e>] Justin

Back in 1978, the astrophysicist Donald Kessler made an alarming prediction: Space junk could wreck our ability to keep satellites aloft. In a fascinating paper, Kessler noted that “low earth orbit” — a region between 99 miles and 1,200 miles up — was getting pretty crowded. In 1978 there were already 3,866 objects being tracked in space. That included satellites used by scientists (say, to monitor weather) or spy agencies. It also included a lot of debris: Every time a rocket launches a satellite into orbit, it tends to leave stray bits of material. The thing is, when objects are zooming through space about 2 km/s, even something as tiny as a chip of paint can smash through glass or steel. Pieces of debris become bullets. What Kessler predicted is that sooner or later, objects in low-earth orbit would start colliding, and produce chain effects, like billiard balls colliding on a crowded pool table. If a piece of debris hit a satellite, it would produce more debris, which would to increase the risk of other collisions … and so on, and so on. At some point, you could reach a tipping point. There’d be so many chunks of debris that collisions would be inevitable, leaving low-earth orbit a junkyard where no satellites could survive. Remember the scene in Wall-E where they blast off Earth, and the planet is utterly ringed with crap? That’s what Kessler worried about. Except in our situation the pieces of junk could be quite small — billions of objects the size of grains of sand, which is actually a lot harder to deal with, because you can’t see it coming. In essence, Kessler predicted we could create an artificial asteroid belt of junk: The result would be an exponential increase in the number of objects with time, creating a belt of debris around the earth. This process of mutual collisions is thought to have been responsible for creating most of the astroids from larger planetlike bodies. Space folks began calling this the “Kessler Syndrome”. It was hard to predict when this might start happening. Kessler worried that conditions could be ripe by as early as 2000. Thankfully, that estimate turned out to be premature. But wow, it looks like it might happen soon. What’s happened recently that makes the “Kessler Syndrome” more likely? A couple of things: Way more satellites are going up The pace at which satellites are going up in the sky is simply exploding. Back when Kessler wrote his paper in 1978, we humans were launching about 53 new satellites a year. Going to space was hard. But now launches are an order of magnitude more common, and they’re increasing in pace rapidly. SpaceX in particular is launching oodles of satellites as it builds its orbital Internet-access service Starlink. In the last two years, it has put 1,740 satellites in low-earth orbit, with plans to eventually shoot 30,000 up there. This is part of a larger trend, which is … The privatization of outer space The private sector is rapidly becoming the dominant actor in space. There’s a huge demand for satellite data — everyone wants better info about weather, crops, traffic patterns, tree coverage, emissions, you name it, on top of the explosive use of satellites for communication and Internet. SpaceX’s remarkable innovations in rocketry (the leading folks, though others are following in their footsteps) have made it cheaper than ever to get a satellite into orbit. It is unlocking a huge pent-up demand for near-earth-orbit tech. More launches mean not only more intentional objects in orbit but unintentional ones — bits of rocket parts and detritus from launches.

#### Spacing mining causes space debris

**Scoles, 15** -- Reporter at New Scientist

[Sarah, "Dust from asteroid mining spells danger for satellites," New Scientist, 5-27-15, https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/, accessed 6-25-21]

IF THE gold mine is too far from home, why not move it nearby? It sounds like a fantasy, but would-be miners are already dreaming up ways to drag resource-rich space rocks closer to home. Trouble is, that could **threaten** the web of **satellites** around Earth. Asteroids are not only stepping stones for cosmic colonisation, but may contain metals like gold, platinum, iron and titanium, plus life-sustaining hydrogen and oxygen, and rocket-fuelling ammonia. Space age forty-niners can either try to work an asteroid where it is, or tug it into a more convenient orbit. NASA chose the second option for its Asteroid Redirect Mission, which aims to pluck a boulder from an asteroid’s surface and relocate it to a stable orbit around the moon. But an asteroid’s gravity is **so weak** that it’s not hard for surface particles to **escape into space**. Now a new model warns that debris shed by such transplanted rocks could **intrude** where many defence and communication satellites live – in geosynchronous orbit. According to Casey Handmer of the California Institute of Technology in Pasadena and Javier Roa of the Technical University of Madrid in Spain, 5 per cent of the escaped debris will end up in regions traversed by satellites. Over 10 years, it would cross geosynchronous orbit **63 times** on average. A satellite in the wrong spot at the wrong time will suffer a **damaging high-speed collision** with that dust. The study also looks at the “catastrophic disruption” of an asteroid 5 metres across or bigger. Its total break-up into a pile of rubble would increase the risk to satellites by more than 30 per cent (arxiv.org/abs/1505.03800). That may not have immediate consequences. But as Earth orbits get **more crowded** with spent rocket stages and satellites, we will have to worry about **cascades of collisions** like the one depicted in the movie Gravity.

#### Privatization exponentially increases the curve but ending dangerous missions prevents it.

Bernat 20 [Pawel, 2020, Military University of Aviation, “ORBITAL SATELLITE CONSTELLATIONS AND THE GROWING THREAT OF KESSLER SYNDROME IN THE LOWER EARTH ORBIT,” SAFETY ENGINEERING OF ANTHROPOGENIC OBJECTS, Volume 4, PDF] Justin

5. Orbital satellite constellations and the growing threat of the Kessler syndrome Space 2.0 – the new era of space exploration that we witness now in the 21st century means, in words of Buzz Aldrin, “moving human enterprise into space” (Pyle, 2019, p. xiv). The process of commercialization of outer space has already begun and is not limited to private companies providing technologies and services for national or international space agencies, as it was in the past. On the contrary, private companies from the space sector have now matured to carry out their own independent projects. As for 2020, SpaceX is a company that serves as the best example – it launches satellites to the orbit, both for state and private contractors, it successfully realized two crew missions to the International Space Station, and is in the process of constructing Starlink satellite constellation that will provide high-speed internet access across the planet. Each satellite weighs around 260 kg, is equipped with an ion propulsion system, autonomous collision avoidance system, and orbits Earth at approximately 540-560 km altitude (Starlink, 2020). At the beginning of November 2020, more than 860 Starlink satellites were orbiting the Earth (Jewett, 2020). Immediate plans include launching 12,000 satellites, but they assume a potential later extension to 42,000 (Henry, 2019a). Of course, SpaceX has employed, at least declaratively, all necessary measures to keep the space clean – the satellites are equipped with the deorbiting system, and in the event of inoperability of the propulsion system (Starlink, 2020). The orbital collisions are, however, inevitable. As it was shown before, the possibility of collisions grows with the number of orbital objects. Bastida Virgili with the team compared (2016, p. 154-155) orbital debris environment development without and with a large hypothetical constellation consisting of merely 1080 satellites, distributed across 20 orbital planes at 1,100 km altitude (Fig. 5).

Chart, line chart

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It has to be noted that although SpaceX’s Starlink is the only constellation that is being built in orbit, it is not the only one planned. There are at least a few initiatives aiming at the same goal – to construct internet infrastructure at the Earth’s orbit. The planned Kuiper Systems LLC, which is a subsidiary of Amazon and intends to place 3,236 broadband satellites in the LEO, is one of Starlink’s biggest competitors (Henry, 2019b). Now, there is even a rivalry between the two companies because Kuiper’s lowest orbital shell is planned to be 590 km, with a tolerance of 9 km either above or below (Cao, 2020), which is the altitude of Starlink satellites. Moreover, the race for space in orbit is now at the beginning. The outer space is vast. It increasingly becomes more cluttered with both operational satellites and space debris. The threat of collisions increases and no institution or body has enough power to license, coordinate and regulate what is sent to the orbit. The UNOOSA has not such power. National states decide what the companies from the space industry can launch to space. In the United States, which is most advanced in the area of private constellations, it is the Federal Aviation Administration (FAA) that issues the appropriate approvals. The race to put broadband internet satellites bears similarities to the gold rush – there are no rules, at the global level, apart from first-come, first-served.

#### Debris causes nuclear war---Noko, Iran, and China.

Beauchamp 14 – Zack, 4/21/14, Zack Beauchamp is a senior correspondent at Vox, where he covers global politics and ideology, and a host of Worldly, Vox's podcast on foreign policy and international relations. His work focuses on the rise of the populist right across the West, the role of identity in American politics, and how fringe ideologies shape the mainstream. Before coming to Vox, he edited TP Ideas, a section of Think Progress devoted to the ideas shaping our political world. He has an MSc from the London School of Economics in International Relations and grew up in Washington, DC, where he currently lives with his wife, daughter, and two (rescue) dogs [“How space trash could start a nuclear war,” Vox, <https://www.vox.com/2014/4/21/5625246/space-war-china-north-korea-iran>] Justin

If debris from a Chinese test destroys a US military satellite, the US could mistake it as a preemptive strike against its space capabilities — some of which are designed to detect nuclear missile launches. If the US thinks China is trying to take out its ability to detect a nuclear launch, things could get very bad, very quickly. Accidents aren't the only concern. Zenko also worries about intentional space attacks, either during peacetime or a crisis. Here, Iran and North Korea are probably bigger threats, though their ASAT capabilities are far from proven. North Korea has a pattern of crazy military moves designed to extort concessions from South Korea and the West; it could extend that behavior to space

### Adv 3: Common Heritage

#### The commercial utilization of outer space is currently prohibited by the Common Heritage of Mankind Principle (CHM) in international law – private appropriation would require new exploitation regimes that undermine CHM which also protects the ocean floor

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The CHM and the province of mankind terminologies are two sides of the same coin. The principles exist in the space treaties to create legal obligations, which in effect dictate co-operation among states parties in aspects of their undertakings concerning outer space, the Moon and other celestial bodies, and in the sharing of the benefits obtainable therefrom. These principles represent a relatively new category of legal classification for the explanation of jurisdiction and control over international territory. Earlier analogies can be found in the law of the sea and the legal regime governing Antarctica. For all relevant purposes the CHM principle applies not only to all 'celestial bodies' no matter how small or large and no matter in which solar system in the infinity of space they are found but also to all that may be considered 'free space' including gases, particles and cosmic dust. It does not operate over the national airspace presently.

It is probably desirable that the applicability of the CHM principle extends to the airspace over the high seas as well. This is a logical consequence of the declaration of the legal nature of the high sea-bed and ocean floor (excluding the continental shelf) and the subsoil thereof as the common heritage of mankind. Furthermore it is suggested that since the sovereignty and jurisdiction granted to states in their national airspace is delimited ratione loci in respect of the space above national territories and notratione materiae in respect of the air, which may at any given time be filling this space. Then there is scope for the separate determination of the legal status of the air itself (i.e. the gaseous envelope surrounding the earth). In that case considering the central and irreplaceable nature of the air to the existence of human beings the sole conclusion that presents itself is that the air (ratione materiae) is best assimilated into the concept of CHM. In other words, if there is at least one thing worthy of being regarded as the common heritage of mankind the air that we breathe would certainly qualify.

Of the older classifications known to law the CHM principle is best represented by the classification of res omnium extra communis. By virtue of this the area covered belongs to entire mankind as represented by states. Sovereignty cannot in anyway be legally enforced over outer space. Until a regime of exploitation is designed for it as was done in the case of ‘the Area’ in the law of the sea, outer space and its resources cannot be exploited on a commercial basis. It may indeed be said that it is better that no such regime of commercial exploitation is ever developed if it would inescapably entail environmental degradation or lead to international conflicts.81

International space law presently has enshrined the CHM principle and there is no convincing reason to abandon it or limit its applicability qualitatively or quantitatively. The arguments against the legal potency of the CHM Principle are altogether insufficient to credibly cast any doubts as to the necessity and the validity of the principle in present day international law. The argument that it represents no more than a hortatory provision is unsupportable given its inclusion in the substantive parts of the Moon Agreement (1979) (Article 11 (1)). The fact that the principle also has enjoyed legal, obligatory and institutional validity in the law of the sea also proves that it was intended to and indeed has legal effect in space law.

Outer space is the most recent to be conquered in the trilogy of most important international spaces. Before the utilisation of outer space based resources can commence on a large scale or for commercial benefits, an elaborate legal regime would have to be developed. At this stage there is no such regime in place. However, as a result of the CHM principle, which applies to outer space and the celestial bodies, commercial exploitation is presently forbidden. Due to the growing restiveness of certain developed states particularly those states that also have been the keenest to exploit the deep-sea bed and Antarctica, it is imperative that all independent states should consider an exploitation regime shortly. Reasons for this include the potential for damage to the environment and the growing importance of outer space activities in the conduct of technological and scientific development. It is also important to put in place a progressive system before illegal or divergent state practice emerges in terms of space exploration and exploitation.

#### The CHM is necessary for international resource management prioritizing equitable distribution and distributive justice

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The principle of the CHM is at the core of the governing system of the Area. Any appropriation of the seabed located in the Area as well as its resources is prohibited,[26]As is any exercise of so-vereignty or of sovereign rights over the Area[27]. In turn, all rights over the resources of the Area are vested in “mankind as a whole” embodied by an intergovernmental organisation, the ISA[28], which is also responsible for ensuring a common manage-ment regime of the activities carried out in the Area.

In addition, the use of the Area is allowed exclusively for peaceful purposes[29]and all activities should only be permitted if the necessary measures to ensure effective protection of the marine environment have been taken[30]. Since the adjacent water column remain subject to the freedom of the seas, due re-gard should also be given to other legitimate uses.[31]Further-more, the utilisation of the Area and its resources should lead to an equitable sharing of benefits taking into particular consideration the interests and needs of developing States.[32]Associated with this is the idea that such interests should serve not only the cur-rent generations but also the interest of future generations.[33]These features of the CHM regime present real innovation[34].This is reflected in the creation of an “appropriate institutional machinery”[35]by UNCLOS to ensure a common management of activities undertaken beyond national jurisdiction and of the re-sources that are to be found. In other words, the establishment of a dedicated body mandated to act as a trustee whose responsibility it is to manage the Area and its resources in compliance with in-ternational law principles and particularly, those included in UN-CLOS[36]. The power granted to the ISA through its mining arm,the Enterprise, to conduct activities in the Area, is in theory and in fact of critical importance.

The second innovation in the CHM regime is to be found in the equitable sharing of benefits, implying distributive justice[37],which is composed of two different aspects dealing respectively with preferential treatment for developing States and the scope of the ‘benefits’ to be redistributed. If UNCLOS explicitly refers to “financial and economic benefits”[38], it is also argued that this specific provision could be interpreted as encompassing direct and non-direct benefits including the data, information and knowledge gathered about the resources[39]. However so far, no clear gui-dance has been provided by the ISA as to its interpretation of thi sformulation.

#### Deep sea mining causes mass environmental damage and extinction

Heffernan 19 Heffernan, Olive. Olive Heffernan is a science journalist in Dublin. "Seabed mining is coming — bringing mineral riches and fears of epic extinctions." Nature, vol. 571, 24 July 2019, pp. 465-8, doi:10.1038/d41586-019-02242-y. [Note CCZ refers to the- Clarion–Clipperton Zone, a seabed region of the Pacific Ocean]

Such has been the troubled trajectory of deep-sea mining ever since eager industrialists proved, nearly a half century ago, that it was technically feasible to extract rare metals and minerals from the ocean floor. Companies and nations have often promised that they would soon start pulling valuable ores from the depths, but commercial efforts have failed to take off for a variety of reasons — notably huge up-front costs, the historically low value of deep-sea ores and the lack of regulations, which have contributed to investors’ wariness.

“The technology is available — it’s the financial and regulatory uncertainty that has held the industry back,” says Govinder Singh Chopra, founder of SeaTech in Singapore, a designer of deep-sea mining support vessels.

Now, it seems this nascent industry’s time has come. A growing demand for batteries to power electric cars and to store wind and solar energy has driven up the cost of many rare-earth metals and bolstered the business case for sea-bed mining. What’s more, the industry’s long-awaited regulations — in the form of a mining code — are due to be finalized by 2020, putting in place a process whereby contractors can apply for 30-year licences to mine assigned ‘claim areas’ in parts of the international sea bed such as the CCZ. Already, miners are exploring the potential wealth of these claim areas, but no commercial extraction will begin until the regulations are in place. Investments in this industry are now growing.

Last month, a start-up called DeepGreen in Vancouver, Canada, announced that it is raising US$150 million to begin exploring mineral wealth in part of the Pacific Ocean — a sign of growing confidence in the industry’s future.

Both scientists and conservationists, however, are worried that the creation of regulations will encourage the industry to start mining long before there is enough information on how operators can avoid causing serious environmental harm. The scarce data that exist suggest that deep-sea mining will have devastating, and potentially irreversible, impacts on marine life.

Since the DISCOL experiment was completed, scientists have returned to the site four times, most recently in 2015. The site has never recovered. In the ploughed areas, which remain as visible today as they were 30 years ago, there’s been little return of characteristic animals such as sponges, soft corals and sea anemones. “The disturbance is much stronger and lasting much longer than we ever would have thought,” says Thiel.

The quiet place

The deep sea — usually defined as the realm below 200 metres — is a world of extremes. Temperatures near the sea bed in many places hover near 0 °C, there is next to no light, and pressures can exceed 1,000 bars, equivalent to having a couple of elephants standing on your big toe. But still life thrives. The deep sea contains a vast array of ecosystems that researchers have barely begun to study.

Miners have focused on three environment types to explore for potential harvesting. Abyssal plains such as the CCZ are littered with metallic nodules that form over millions of years as minerals precipitate around fish teeth, bones or other small objects. These regions are some of the quietest, most remote ecosystems on the planet, where fine sediment rains down at a rate of about one centimetre every 1,000 years. That low-energy environment is home to polychaete worms, crustaceans, sponges, sea cucumbers, starfish, brittlestars, sea urchins and various deep-sea fish, as well as countless microbial species and tiny sediment-dwelling creatures.

Another type of mineral deposit is the metal-rich crust that covers seamounts, which rise thousands of metres above the abyssal plains. These coatings are packed with high-value metals, such as cobalt, platinum and molybdenum. The seamount environment is dominated by corals, sponges and other filter feeders as well as tuna, sharks, dolphins and sea turtles.

Four types of deep sea fauna

Deep sea creatures found near a mid-ocean ridge in the southern Indian Ocean. Clockwise from top left: an anemone, a brittle star, Acanthogorgiidae coral and a pencil urchin.Credit: Nature Picture Library/Alamy

A third form of mineral deposit that is attracting attention is massive sulfides — rich in copper, lead, zinc, gold and silver. These ores form around vents of superheated water that occur along the volcanic ridges running through ocean basins. The hydrothermal vents support creatures such as the small, blind yeti crab (Kiwa tyleri) with its characteristic blonde, furry hair, and the scaly-foot snail (Chrysomallon squamiferum), which armours its soft interior with an iron shell and is the first deep-sea animal to be declared endangered because of the threat of mining.

For years, it was assumed that the first deep-sea environment to be mined would be hydrothermal vents in Papua New Guinea’s territorial waters. Nautilus Minerals in Toronto, Canada, was pursuing that project, but financial difficulties and local opposition derailed the venture, leaving the CCZ as the most likely test bed for deep-sea mining. Estimates suggest that the nodules in that region contain more cobalt, manganese and nickel than the total of all known deposits on land (see ‘Sunken treasure’). The CCZ stretches from Hawaii to the Baja California Peninsula, and is as wide as the contiguous United States.

Companies are steadily moving forward with plans to exploit the minerals in the CCZ. The International Seabed Authority (ISA) — a 168-member body created by the United Nations to both promote and regulate sea-bed mining — has, in the past decade, granted 29 exploration licences for contractors sponsored by national governments to explore mineral wealth at a number of deep-sea locations. Of the licences granted, 16 are for the CCZ, and these cover about 20% of the total area.

Since Thiel’s first visit to the region in 1972, scientists have explored it in much more detail. Deep-sea biologist Craig Smith at the University of Hawaii in Honolulu has spent 30 years studying the communities in the CCZ, where he has collected sea cucumbers, sea urchins, soft corals, starfish, sea anemones, worms and much more. Roughly 90% of the animal species his group has collected are new to science or undescribed. Among these are rare species not found anywhere else in the deep sea. Smith thinks that, even now, scientists have sampled just 0.01% of the total area of the CCZ.

In one single UK claim area of 55,000 square kilometres, Smith and his colleagues were surprised to collect more than 1,000 animal species, which they estimate is less than half the total number living there. “And that’s not counting the microbes, of which there are over 100,000 different species,” says Smith. “We expect that there are thousands of species that are unique to the CCZ,” he says. “I’ve been studying biodiversity there for decades, but we still don’t know that much.” Some of the species could have small ranges, so if they were to be wiped out, it would be a global extinction.

Data gaps

Although deep-sea mining threatens some of these species, it has also raised awareness of the biodiversity of the sea-floor environment. By law, mining contractors are required to assess what lives in their claim area, and Smith and many other deep-sea biologists conduct ecological surveys to help contractors establish this baseline. And prospective miners can carry out tests to understand how their equipment will impact the environment they are working in.

The aim of such studies is to help miners and the ISA reduce any potential harm from the industry and to develop environmental management plans. But many researchers say that the system has not worked well in practice, in part because the requirements for baseline data are weak.

The data have been confidential, but are becoming publicly available this month. “It’s going to be quite telling because we’ll have an insight for the first time into the quality and quantity of contractor data. My guess is that many contractors are not putting together what we would regard as a thorough baseline assessment,” says Daniel Jones, a deep-sea ecologist at the National Oceanography Centre in Southampton, UK.

Another concern among researchers is that there are no requirements to test the environmental impacts of the giant mining machines before commercial extraction begins. Since 1970, only 12 small-scale tests have been done on nodule mining, most using a narrow, roughly 2.5-metre-wide instrument to disturb the sea floor. Of these, DISCOL is regarded as the most advanced, mostly because of the wider plough, the large area covered and the long time series of data. “All of these studies have flaws, and DISCOL, too, is imperfect, but it’s the best we have,” says Jones.

Many scientists and conservationists say that the root of some of the problems is that the ISA has dual responsibilities. When it was established by the UN in 1994, the ISA was given two mandates: to protect the international sea bed from serious harm, and to develop its resources, ensuring that their exploitation benefits humankind. (In national waters, countries can develop their own rules around sea-bed mining, but they must be at least at strict as the rules that will be adopted next year by the ISA). The “ISA is both poacher and gamekeeper”, says Hannah Lily, a maritime lawyer with the Pew Charitable Trusts in London, who is not speaking on behalf of Pew.

The ISA has responded to some of these concerns. It says that “an extremely important aspect of ISA’s mandate is ensuring appropriate environmental assessments and safeguards in the activities that it regulates”, for instance.

It also says that “its decisions are made by consensus among the 168 countries that make up its membership, all countries having one vote”. So far, the membership has approved only exploration activities.

The Belgian contractor Global Sea Mineral Resources has defended how mining contractors and the ISA are moving forward. It says that the ISA has been proactive in establishing an environmental management plan that includes setting aside nine areas of particular environmental interest. The intention is keep these areas — about 30% of the CCZ — free of mining to protect biodiversity.

Smothered by sediment

Mining in the CCZ, if it does happen, is still almost a decade away, with Global Sea Mineral Resources aiming to open a commercial deep-sea mine by 2027. When it does kick off, the scene at the ocean bottom will look something like this: robotic machines as large as combine harvesters will crawl along, picking up metallic nodules and sucking up the top 10 centimetres or so of soft sediment with them. Because the nodules grow so slowly, mining them will effectively remove them from the sea floor permanently, say scientists.

The nodules are an irreplaceable habitat for many of the creatures that live in the CCZ. “For most of the animals in the direct vicinity, mining will be lethal. It will wipe out most of the large animals and everything that’s attached to the nodules. That’s a given, I would say,” says Henko de Stigter, an ocean-systems scientist at the Royal Netherlands Institute for Sea Research in Texel, whose assessment is shared by many researchers.

But the impacts of mining in the CCZ would be much broader than just killing the ecosystem around the nodules. As the collectors moved across the sea floor, they would stir up large clouds of soft sediment that would disperse, possibly for tens of thousands of kilometres, before eventually resettling. At high densities, sediment plumes can bury and smother the animals on the sea floor. Just how far the sediment will disperse remains unknown. “We’re only starting to see how far the plume reaches and we’re still very far from knowing what the effect will be,” says de Stigter. Next month, he will test the impacts of a prototype nodule harvester in shallow Mediterranean waters.

Scientists are also carrying out laboratory and computer simulations to assess the impact of the disturbed sediment. One computer-modelling study, published in January (B. Gillard et al. Elem. Sci. Anth. 7, 5; 2019), found that the sediment could take up to ten times longer to resettle than is currently assumed, meaning it will probably travel farther in the water column. And some researchers say that even trace amounts of sediment stirred up by the mining operations could smother sea-floor life far away.

In the CCZ, once the nodules have been collected by a harvester, they’ll be shunted up a kilometres-long tube to a large surface support vessel, which will sort out millions of nodules a day and return the waste sediment to the sea, creating yet another plume. Right now, there’s little clarity on where the waste will be released, in part because returning sediments to the sea bed is costly and technically challenging. One suggestion is to reinject the plume at a depth of 1,000 metres, still thousands of metres above the sea bed. Scientists worry that this practice could harm or kill life at mid-water depths, just as Thiel feared 30 years ago.

Without more information about these deep-sea environments, researchers don’t even know how to define the risks. “What is serious harm? There are some clear red lines, but there’s no definitive answer to that question yet,” says Gordon Paterson, one of three ecologists who sit on the ISA’s Legal and Technical Commission (LTC), which is, in part, a scientific advisory body. “We understand that global extinction is serious harm and we know that interference in carbon sequestration is serious harm. Scientists know that mining will cause local extinction of species in the CCZ, but are we talking about the extinction of species across the CCZ or just in the mined area? It is complicated,” he says.