#### The standard is maximizing expected wellbeing.

#### 1] Life has a priori value achieved through pleasure.

Amien Kacou 8 WHY EVEN MIND? On The A Priori Value Of “Life”, Cosmos and History: The Journal of Natural and Social Philosophy, Vol 4, No 1-2 (2008) cosmosandhistory.org/index.php/journal/article/view/92/184

Furthermore, that manner of finding things good that is in pleasure can certainly not exist in any world without consciousness (i.e., without “life,” as we now understand the word)—slight analogies put aside. In fact, we can begin to develop a more sophisticated definition of the concept of “pleasure,” in the broadest possible sense of the word, as follows: it is the common psychological element in all psychological experience of goodness (be it in joy, admiration, or whatever else). In this sense, pleasure can always be pictured to “mediate” all awareness or perception or judgment of goodness: there is pleasure in all consciousness of things good; pleasure is the common element of all conscious satisfaction. In short, it is simply the veryexperience of liking things, or the liking of experience, in general. In this sense, pleasure is, not only uniquely characteristic of life but also, the core expression of goodness in life—the most general sign or phenomenon for favorable conscious valuation, in other words. This does not mean that “good” is absolutely synonymous with “pleasant”—what we value may well go beyond pleasure. (The fact that we value things needs not be reduced to the experience of liking things.) However, what we value beyond pleasure remains a matter of speculation or theory. Moreover, we note that a variety of things that may seem otherwise unrelated are correlated with pleasure—some more strongly than others. In other words, there are many things the experience of which we like. For example: the admiration of others; sex; or rock-paper-scissors. But, again, what they are is irrelevant in an inquiry on a priori value—what gives us pleasure is a matter for empirical investigation. Thus, we can see now that, in general, something primitively valuable is attainable in living—that is, pleasure itself. And it seems equally clear that we have a priori logical reason to pay attention to the world in any world where pleasure exists. Moreover, we can now also articulate a foundation for a security interest in our life: since the good of pleasure can be found in living (to the extent pleasure remains attainable),[17] and only in living, therefore, a priori, life ought to be continuously (and indefinitely) pursued at least for the sake of preserving the possibility of finding that good. However, this platitude about the value that can be found in life turns out to be, at this point, insufficient for our purposes. It seems to amount to very little more than recognizing that our subjective desire for life in and of itself shows that life has some objective value. For what difference is there between saying, “living is unique in benefiting something I value (namely, my pleasure); therefore, I should desire to go on living,” and saying, “I have a unique desire to go on living; therefore I should have a desire to go on living,” whereas the latter proposition immediately seems senseless? In other words, “life gives me pleasure,” says little more than, “I like life.” Thus, we seem to have arrived at the conclusion that the fact that we already have some (subjective) desire for life shows life to have some (objective) value. But, if that is the most we can say, then it seems our enterprise of justification was quite superficial, and the subjective/objective distinction was useless—for all we have really done is highlight the correspondence between value and desire. Perhaps, our inquiry should be a bit more complex.

#### 2] Only consequentialism explains necessary enablers.

Sinnott-Armstrong 92 [Walter, professor of practical ethics. “An Argument for Consequentialism” Dartmouth College Philosophical Perspectives. 1992.]

A moral reason to do an act is consequential if and only if the reason depends only on the consequences of either doing the act or not doing the act. For example, a moral reason not to hit someone is that this will hurt her or him. A moral reason to turn your car to the left might be that, if you do not do so, you will run over and kill someone. A moral reason to feed a starving child is that the child will lose important mental or physical abilities if you do not feed it. All such reasons are consequential reasons. All other moral reasons are non-consequential. Thus, a moral reason to do an act is non-consequential if and only if the reason depends even partly on some property that the act has independently of its consequences. For example, an act can be a lie regardless of what happens as a result of the lie (since some lies are not believed), and some moral theories claim that that property of being a lie provides amoral reason not to tell a lie regardless of the consequences of this lie. Similarly, the fact that an act fulfills a promise is often seen as a moral reason to do the act, even though the act has that property of fulfilling a promise independently ofits consequences. All such moral reasons are non-consequential. In order to avoid so many negations, I will also call them 'deontological'. This distinction would not make sense if we did not restrict the notion of consequences. If I promise to mow the lawn, then one consequence of my mowing might seem to be that my promise is fulfilled. One way to avoid this problem is to specify that the consequences of an act must be distinct from the act itself. My act of fulfilling my promise and my act of mowing are not distinct, because they are done by the same bodily movements.10 Thus, my fulfilling my promise is not a consequence of my mowing. A consequence of an act need not be later in time than the act, since causation can be simultaneous, but the consequence must at least be different from the act. Even with this clarification, it is still hard to classify some moral reasons as consequential or deontological,11 but I will stick to examples that are clear. In accordance with this distinction between kinds of moral reasons, I can now distinguish different kinds of moral theories. I will say that a moral theory is consequentialist if and only if it implies that all basic moral reasons are consequential. A moral theory is then non-consequentialist or deontological if it includes any basic moral reasons which are not consequential. 5. Against Deontology So defined, the class of deontological moral theories is very large and diverse. This makes it hard to say anything in general about it. Nonetheless, I will argue that no deontological moral theory can explain why moral substitutability holds. My argument applies to all deontological theories because it depends only on what is common to them all, namely, the claim that some basic moral reasons are not consequential. Some deontological theories allow very many weighty moral reasons that are consequential, and these theories might be able to explain why moral substitutability holds for some of their moral reasons: the consequential ones. But even these theories cannot explain why moral substitutability holds for all moral reasons, including the non-consequential reasons that make the theory deontological. The failure of deontological moral theories to explain moral substitutability in the very cases that make them deontological is a reason to reject all deontological moral theories. I cannot discuss every deontological moral theory, so I will discuss only a few paradigm examples and show why they cannot explain moral substitutability. After this, I will argue that similar problems are bound to arise for all other deontological theories by their very nature. The simplest deontological theory is the pluralistic intuitionism of Prichard and Ross. Ross writes that, when someone promises to do something, 'This we consider obligatory in its own nature, just because it is a fulfillment of a promise, and not because of its consequences.'12 Such deontologists claim in effect that, if I promise to mow the grass, there is a moral reason for me to mow the grass, and this moral reason is constituted by the fact that mowing the grass fulfills my promise. This reason exists regardless of the consequences of mowing the grass, even though it might be overridden by certain bad consequences. However, if this is why I have a moral reason to mow the grass, then, even if I cannot mow the grass without starting my mower, and starting the mower would enable me to mow the grass, it still would not follow that I have any moral reason to start my mower, since I did not promise to start my mower, and starting my mower does not fulfill my promise. Thus, a moral theory cannot explain moral substitutability if it claims that properties like this provide moral reasons.

#### 3] Degrees of wrongness -- only consequentialism can explain the ethical difference in breaking a promise to take someone to the hospital and breaking a promise to take someone to lunch

#### 4] There is no distinction between intending things and foreseeing them -- if we foresee a consequence, then it becomes part of our deliberation which makes it intrinsic to our action since we intend it to happen --

#### Asteroid Mining

#### Private companies are leading the race to finding life saving resources in space

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While the price tag involved in establishing a human colony on the Moon or Mars is mind-boggling, the costs of sustaining off-Earth colonies and keeping them resupplied indefinitely are even more so — unless the settlements can somehow pay for themselves. Mining for much-needed metals and sending them back to Earth could change the game for space exploration, transforming off-world ventures from prohibitively expensive to financially viable. That being said, bringing a heavy payload of minerals down through Earth’s atmosphere is not currently feasible. Futurists believe that instead, minerals mined in space will be used in space as humanity spreads outwards.

Rare Earth Materials Are Abundant. There are around two million near-earth asteroids brimming with rare earth minerals, precious metals, iron, and nickel. The Moon contains helium-3, yttrium, samarium, and lanthanum, while Mars contains an abundance of magnesium, aluminum, titanium, iron, chromium, and trace amounts of lithium, cobalt, tungsten, and other metals. Importantly, many planetary bodies contain water, which through hydrolysis can be used as rocket fuel.

It Helps with Sustainability. Earth’s resources are finite. Non-renewable metal resources are inherently unsustainable, and mining causes environmental degradation all over the world. The answer is to source our minerals off-world. Off-world minerals are exhaustible as well, but the argument is that mining lifeless rocks such as the Moon or asteroids is infinitely preferable to continuing to damage Earth’s fragile biosphere.

Discoveries May Be Made Opening space to commercial mining does not mean that science takes a back seat. Space-mining interests could drive scientific advancement by discovering extremely rare or unknown minerals on other planetary bodies.

Robotics Would Do the Work While countless lives have been lost on Earth over the centuries due to mining accidents and disasters, it is likely that humans will not have to risk their lives by traveling in-person to off-world mining sites. Regolith-sampling probes are already in use and provide an early glimpse of what a scaled-up robotic mining craft may one day look like.

Off-Earth Mining and Space Law The [1967 Outer Space Treaty](https://www.thomasnet.com/insights/is-the-outer-space-treaty-outdated/) is unclear in terms of whether any country — or private company — can claim mineral rights in space. It states that “exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind.” The[1979 Moon Treaty](https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/moon-agreement.html) was an attempt to declare the Moon and its natural resources to be CHM (Common Heritage of Mankind). Significantly, it called for “an equitable sharing [by all countries] in the benefits derived from these resources.” Most nations, including the U.S., did not ratify this treaty.Recently, the U.S. has accelerated its efforts to create a legal framework for the exploitation of resources in space.The Obama administration signed the [U.S. Commercial Space Launch Competitiveness Act of 2015](https://www.faa.gov/about/office_org/headquarters_offices/ast/media/US-Commercial-Space-Launch-Competitiveness-Act-2015.pdf), allowing U.S. citizens to “engage in the commercial exploration and exploitation of space resources.”In April 2020, the Trump administration issued an [executive order](https://www.space.com/trump-moon-mining-space-resources-executive-order.html) supporting U.S. mining on the Moon and asteroids.In May 2020, NASA unveiled the [Artemis Accords](https://www.washingtonpost.com/technology/2020/05/15/moon-rules-nasa-artemis/), which included the development of safety zones around lunar mining sites. Former NASA administrator Jim Bridenstine said: “It’s time to establish the regulatory certainty to extract and trade space resources,” and clarified in a separate statement that: “We do believe we can extract and utilize the resources of the moon, just as we can extract and utilize tuna from the ocean.” NASA planned an [Asteroid Redirect Mission](https://www.nasa.gov/content/what-is-nasa-s-asteroid-redirect-mission) which involved collecting a multi-ton boulder from an asteroid and redirecting it into a stable orbit around the moon, but the mission was canceled in 2017. What Companies Are Preparing for a Future of Space Mining?One thing that is becoming clear is that off-earth mining is unlikely to be a state-run activity. Instead, several private companies are jockeying to be first in line to access minerals in space. [iSpace](https://ispace-inc.com/) (Japan) has a mission to “help companies access new business opportunities on the moon,” including the extraction of water and mineral resources to spearhead a space-based economy. Planetary Resources (defunct) was founded in 2009 with the goal of developing a robotic asteroid mining industry. Despite having high-profile founding investors including Alphabet’s Larry Page, Eric Schmidt, and Virgin Group founder Richard Branson, Planetary ran into financial trouble in 2018 and was gone by 2020. Deep Space Industries (defunct) was another early mover that intended to explore, examine, sample, and harvest minerals from asteroids. DSI was acquired by Bradford Space in 2019.[Offworld](https://www.offworld.ai/) is an AI company building “universal industrial robots to do the heavy lifting [including mining] on Earth, the Moon, asteroids, and Mars.” [The Asteroid Mining Corporation](https://asteroidminingcorporation.co.uk/) (UK) is a venture currently crowdfunding for a 2023 satellite mission called “El Dorado,” which will conduct a spectral survey of 5,000 asteroids to identify the most valuable for mining.  Alongside the U.S., the tiny European nation of Luxembourg has also developed a space mining framework and has subsequently [emerged as a European hub](https://www.businesswire.com/news/home/20201118005699/en/) for the fledgling industry.

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#### Asteroid mining is going to happen soon.

Alex Gilbert, 4-26-2021, "Mining in Space Is Coming," Milken Institute Review, https://www.milkenreview.org/articles/mining-in-space-is-coming

Space exploration is back. After decades of disappointment, a combination of better technology, falling costs and a rush of competitive energy from the private sector has put space travel front and center. Indeed, many analysts (even some with their feet on the ground) believe that **commercial developments in the space industry** may be **on the cusp** of **start**ing the largest resource rush in history: **mining on** the Moon, Mars and **asteroids.** While this may sound fantastical, some baby steps toward the goal have already been taken. Last year, NASA awarded contracts to four companies to extract small amounts of lunar regolith by 2024, effectively beginning the [era of commercial space mining](https://payneinstitute.mines.edu/wp-content/uploads/sites/149/2020/09/Payne-Institute-Commentary-The-Era-of-Commercial-Space-Mining-Begins.pdf). Whether this proves to be the dawn of a gigantic adjunct to mining on earth — and more immediately, a key to unlocking cost-effective space travel — will turn on the answers to a host of questions ranging from what resources can be efficiently. As every fan of science fiction knows, the resources of the solar system appear virtually unlimited compared to those on Earth. There are whole other planets, dozens of moons, thousands of massive asteroids and millions of small ones that doubtless contain humungous quantities of materials that are scarce and very valuable (back on Earth). Visionaries including Jeff Bezos [imagine heavy industry moving to space](https://www.fastcompany.com/90347364/jeff-bezos-wants-to-save-earth-by-moving-industry-to-space) and Earth becoming a residential area. However, as entrepreneurs look to harness the riches beyond the atmosphere, access to space resources remains tangled in the realities of economics and governance.

#### Private sector mining overcomes all extinction scenarios – the resources it provides solve back resource shortages, climate change, and extinction level natural disasters

Pelton 17—Director Emeritus of the Space and Advanced Communications Research Institute at George Washington University, PHD in IR from Georgetown.. Pelton, Joseph N. 2017. The New Gold Rush: The Riches of Space Beckon! Springer. Accessed 8/30/19.

Are We Humans Doomed to Extinction? What will we do when Earth’s resources are used up by humanity? The world is now hugely over populated, with billions and billions crammed into our overcrowded cities. By 2050, we may be 9 billion strong, and by 2100 well over 11 billion people on Planet Earth. Some at the United Nations say we might even be an amazing 12 billion crawling around this small globe. And over 80 % of us will be living in congested cities. These cities will be ever more vulnerable to terrorist attack, natural disaster, and other plights that come with overcrowding and a dearth of jobs that will be fueled by rapid automation and the rise of artifi cial intelligence across the global economy. We are already rapidly running out of water and minerals. Climate change is threatening our very existence. Political leaders and even the Pope have cautioned us against inaction. Perhaps the naysayers are right. All humanity is at tremendous risk. Is there no hope for the future? This book is about hope. We think that there is literally heavenly hope for humanity. But we are not talking here about divine intervention. We are envisioning a new space economy that recognizes that there is more water in the skies that all our oceans. Th ere is a new wealth of natural resources and clean energy in the reaches of outer space—more than most of us could ever dream possible. There are those that say why waste money on outer space when we have severe problems here at home? Going into space is not a waste of money. It is our future. It is our hope for new jobs and resources. The great challenge of our times is to reverse public thinking to see space not as a resource drain but as the doorway to opportunity. The new space frontier can literally open up a “gold rush in the skies.” In brief, we think there is new hope for humanity. We see a new a pathway to the future via new ventures in space. For too long, space programs have been seen as a money pit. In the process, we have overlooked the great abundance available to us in the skies above. It is important to recognize there is already the beginning of a new gold rush in space—a pathway to astral abundance. “New Space” is a term increasingly used to describe radical new commercial space initiatives—many of which have come from Silicon Valley and often with backing from the group of entrepreneurs known popularly as the “space billionaires.” New space is revolutionizing the space industry with lower cost space transportation and space systems that represent significant cost savings and new technological breakthroughs. “New Commercial Space” and the “New Space Economy” represent more than a new way of looking at outer space. These new pathways to the stars could prove vital to human survival. If one does not believe in spending money to probe the mysteries of the universe then perhaps we can try what might be called “calibrated greed” on for size. One only needs to go to a cubesat workshop, or to Silicon Valley or one of many conferences like the “Disrupt Space” event in Bremen, Germany, held in April 2016 to recognize that entrepreneurial New Space initiatives are changing everything [ 1 ]. In fact, the very nature and dimensions of what outer space activities are today have changed forever. It is no longer your grandfather’s concept of outer space that was once dominated by the big national space agencies. The entrepreneurs are taking over. The hopeful statements in this book and the hard economic and technical data that backs them up are more than a minority opinion. It is a topic of growing interest at the World Economic Forum, where business and political heavyweights meet in Davos, Switzerland, to discuss how to stimulate new patterns of global economic growth. It is even the growing view of a group that call themselves “space ethicists.” Here is how Christopher J. Newman, at the University of Sunderland in the United Kingdom has put it: Space ethicists have offered the view that space exploration is not only desirable; it is a duty that we, as a species, must undertake in order to secure the survival of humanity over the longer term. Expanding both the resource base and, eventually, the habitats available for humanity means that any expenditure on space exploration, far from being viewed as frivolous, can legitimately be rationalized as an ethical investment choice. (Newman) On the other hand there are space ethicists and space exobiologists who argue that humans have created ecological ruin on the planet—and now space debris is starting to pollute space. Th ese countervailing thoughts by the “no growth” camp of space ethicists say we have no right to colonize other planets or to mine the Moon and asteroids—or at least no right to do so until we can prove we can sustain life here on Earth for the longer term. However, for most who are planning for the new space economy the opinion of space philosophers doesn’t really fl oat their boat. Legislators, bankers, and aspiring space entrepreneurs are far more interested in the views of the super-rich capitalists called the space billionaires. A number of these billionaires and space executives have already put some very serious money into enterprises intent on creating a new pathway to the stars. No less than five billionaires with established space ventures—Elon Musk, Paul Allen, Jeff Bezos, Sir Richard Branson, and Robert Bigelow—have invested millions if not billions of dollars into commercializing space. They are developing new technologies and establishing space enterprises that can bring the wealth of outer space down to Earth. This is not a pipe dream, but will increasingly be the economic reality of the 2020s. These wealthy space entrepreneurs see major new economic opportunities. To them space represents the last great frontier for enterprising pioneers. Th us they see an ever-expanding space frontier that offers opportunities in low-cost space transportation, satellite solar power satellites to produce clean energy 24h a day, space mining, space manufacturing and production, and eventually space habitats and colonies as a trajectory to a better human future. Some even more visionary thinkers envision the possibility of terraforming Mars, or creating new structures in space to protect our planet from cosmic hazards and even raising Earth’s orbit to escape the rising heat levels of the Sun in millennia to come. Some, of course, will say this is sci-fi hogwash. It can’t be done. We say that this is what people would have said in 1900 about airplanes, rocket ships, cell phones and nuclear devices. The skeptics laughed at Columbus and his plan to sail across the oceans to discover new worlds. When Thomas Jefferson bought the Louisiana Purchase from France or Seward bought Alaska, there were plenty of naysayers that said such investment in the unknown was an extravagant waste of money. A healthy skepticism is useful and can play a role in economic and business success. Before one dismisses the idea of an impending major new space economy and a new gold rush, it might useful to see what has already transpired in space development in just the past five decades. The world’s first geosynchronous communications satellite had a throughput capability of about 500 kb / s. In contrast, today’s state of the art Viasat 2 —a half century later— has an impressive throughput of some 140 Gb/s. Th is means that the relative throughput is nearly 300,000 greater, while its lifetime is some ten times longer (Figs. 1.1 and 1.2 ). Each new generation of communications satellite has had more power, better antenna systems, improved pointing and stabilization, and an extended lifetime. And the capabilities represented by remote sensing satellites , meteorological satellites , and navigation and timing satellites have also expanded their capabilities and performance in an impressive manner. When satellite applications first started, the market was measured in millions of dollars. Today commercial satellite services exceed a quarter of a billion dollars. Vital services such as the Internet, aircraft traffi c control and management, international banking, search and rescue and much, much more depend on application satellites. Th ose that would doubt the importance of satellites to the global economy might wish to view on You Tube the video “If Th ere Were a Day Without Satellites?” [ 2 ]. Let’s check in on what some of those very rich and smart guys think about the new space economy and its potential. (We are sorry to say that so far there are no female space billionaires, but surely this, too, will come someday soon.) Of course this twenty-fi rst century breakthrough that we call the New Space economy will not come just from new space commerce. It will also come from the amazing new technologies here on Earth. Vital new terrestrial technologies will accompany this cosmic journey into tomorrow. Information technology, robotics, artificial intelligence and commercial space travel systems have now set us on a course to allow us humans to harvest the amazing riches in the skies—new natural resources, new energy, and even totally new ways of looking at the purpose of human existence. If we pursue this course steadfastly, it can be the beginning of a New Space renaissance. But if we don’t seek to realize our ultimate destiny in space, Homo sapiens can end up in the dustbin of history—just like literally millions of already failed species. In each and every one of the five mass extinction events that have occurred over the last 1.5 billion years on Earth, some 50–80 % of all species have gone the way of the T. Rex, the woolly mammoth, and the Dodo bird along with extinct ferns, grasses and cacti. On the other hand, the best days of the human race could be just beginning. If we are smart about how we go about discovering and using these riches in the skies and applying the best of our new technologies, it could be the start of a new beginning for humanity. Konstantin Tsiokovsky, the Russian astronautics pioneer, who fi rst conceived of practical designs for spaceships, famously said: “A planet is the cradle of mankind, but one cannot live in a cradle forever.” Well before Tsiokovsky another genius, Leonardo da Vinci, said, quite poetically: “Once you have tasted flight, you will forever walk the earth with your eyes turned skyward, for there you have been, and there you will always long to return.” The founder of the X-Prize and of Planetary Resources, Inc., Dr. Peter Diamandis, has much more brashly said much the same thing in quite diff erent words when he said: “The meek shall inherit the Earth. The rest of us will go to Mars.” The New Space Billionaires Peter Diamandis is not alone in his thinking. From the list of “visionaries” quoted earlier, Elon Musk, the founder of SpaceX; Sir Richard Branson, the founder of Virgin Galactic; and Paul Allen, the co-founder of Microsoft and the man who financed SpaceShipOne, the world’s first successful spaceplane have all said the future will include a vibrant new space economy. They, and others, have said that we can, we should and we soon shall go into space and realize the bounty that it can offer to us. Th e New Space enterprise is today indeed being led by those so-called space billionaires , who have an exciting vision of the future. They and others in the commercial space economy believe that the exploitation of outer space may open up a new golden age of astral abundance. They see outer space as a new frontier that can be a great source of new materials, energy and various forms of new wealth that might even save us from excesses of the past. Th is gold rush in the skies represents a new beginning. We are not talking about expensive new space ventures funded by NASA or other space agencies in Europe, Japan, China or India. No, these eff orts which we and others call New Space are today being forged by imaginative and resourceful commercial entrepreneurs. Th ese twenty-fi rst century visionaries have the fortitude and zeal to look to the abundance above. New breakthroughs in technology and New Space enterprises may be able to create an “astral life raft” for humanity. Just as Columbus and the Vikings had the imaginative drive that led them to discover the riches of a new world, we now have a cadre of space billionaires that are now leading us into this New Space era of tomorrow. These bold leaders, such as Paul Allen and Sir Richard Branson, plus other space entrepreneurs including Jeff Bezos of Amazon and Blue Origin, and Robert Bigelow, Chairman of Budget Suites and Bigelow Aerospace, not only dream of their future in the space industry but also have billions of dollars in assets. These are the bright stars of an entirely new industry that are leading us into the age of New Space commerce. These space billionaires, each in their own way, are proponents of a new age of astral abundance. Each of them is launching new commercial space industries. They are literally transforming our vision of tomorrow. These new types of entrepreneurial aerospace companies—the New Space enterprises—give new hope and new promise of transforming our world as we know it today. The New Space Frontier What happens in space in the next few decades, plus corresponding new information technologies and advanced robotics, will change our world forever. These changes will redefine wealth, change our views of work and employment and upend almost everything we think we know about economics, wealth, jobs, and politics. Th ese changes are about truly disruptive technologies of the most fundamental kinds. If you thought the Internet, smart phones, and spandex were disruptive technologies, just hang on. You have not seen anything yet. In short, if you want to understand a transition more fundamental than the changes brought to the twentieth century world by computers, communications and the Internet, then read this book. There are truly riches in the skies. Near-Earth asteroids largely composed of platinum and rare earth metals have an incredible value. Helium-3 isotopes accessible in outer space could provide clean and abundant energy. There is far more water in outer space than is in our oceans. In the pages that follow we will explain the potential for a cosmic shift in our global economy, our ecology, and our commercial and legal systems. These can take place by the end of this century. And if these changes do not take place we will be in trouble. Our conventional petro-chemical energy systems will fail us economically and eventually blanket us with a hydrocarbon haze of smog that will threaten our health and our very survival. Our rare precious metals that we need for modern electronic appliances will skyrocket in price, and the struggle between “haves” and “have nots” will grow increasingly ugly. A lack of affordable and readily available water, natural resources, food, health care and medical supplies, plus systematic threats to urban security and systemic warfare are the alternatives to astral abundance. The choices between astral abundance and a downward spiral in global standards of living are stark. Within the next few decades these problems will be increasingly real. By then the world may almost be begging for new, out of- the-box thinking. International peace and security will be an indispensable prerequisite for exploitation of astral abundance, as will good government for all. No one nation can be rich and secure when everyone else is poor and insecure. In short, global space security and strategic space defense, mediated by global space agreements, are part of this new pathway to the future.

#### Resource shortages go nuclear.

Klare 13 – Michael T., professor emeritus of peace and world-security studies at Hampshire College and senior visiting fellow at the Arms Control Association in Washington, DC, " How Resource Scarcity and Climate Change Could Produce a Global Explosion", *The Nation*, 4/22/2013, <https://www.thenation.com/article/how-resource-scarcity-and-climate-change-could-produce-global-explosion/> JHW

Resource Shortages and Resource Wars Start with one simple given: the prospect of future scarcities of vital natural resources, including energy, water, land, food and critical minerals. This in itself would guarantee social unrest, geopolitical friction and war. It is important to note that absolute scarcity doesn’t have to be on the horizon in any given resource category for this scenario to kick in. A lack of adequate supplies to meet the needs of a growing, ever more urbanized and industrialized global population is enough. Given the wave of extinctions that scientists are recording, some resources—particular species of fish, animals and trees, for example—will become less abundant in the decades to come, and may even disappear altogether. But key materials for modern civilization like oil, uranium and copper will simply prove harder and more costly to acquire, leading to supply bottlenecks and periodic shortages. Oil—the single most important commodity in the international economy—provides an apt example. Although global oil supplies may actually grow in the coming decades, many experts doubt that they can be expanded sufficiently to meet the needs of a rising global middle class that is, for instance, expected to buy millions of new cars in the near future. In its 2011 World Energy Outlook, the International Energy Agency claimed that an anticipated global oil demand of 104 million barrels per day in 2035 will be satisfied. This, the report suggested, would be thanks in large part to additional supplies of “unconventional oil” (Canadian tar sands, shale oil and so on), as well as 55 million barrels of new oil from fields “yet to be found” and “yet to be developed.” However, many analysts scoff at this optimistic assessment, arguing that rising production costs (for energy that will be ever more difficult and costly to extract), environmental opposition, warfare, corruption and other impediments will make it extremely difficult to achieve increases of this magnitude. In other words, even if production manages for a time to top the 2010 level of 87 million barrels per day, the goal of 104 million barrels will never be reached and the world’s major consumers will face virtual, if not absolute, scarcity. Water provides another potent example. On an annual basis, the supply of drinking water provided by natural precipitation remains more or less constant: about 40,000 cubic kilometers. But much of this precipitation lands on Greenland, Antarctica, Siberia and inner Amazonia where there are very few people, so the supply available to major concentrations of humanity is often surprisingly limited. In many regions with high population levels, water supplies are already relatively sparse. This is especially true of North Africa, Central Asia and the Middle East, where the demand for water continues to grow as a result of rising populations, urbanization and the emergence of new water-intensive industries. The result, even when the supply remains constant, is an environment of increasing scarcity. Wherever you look, the picture is roughly the same: supplies of critical resources may be rising or falling, but rarely do they appear to be outpacing demand, producing a sense of widespread and systemic scarcity. However generated, a perception of scarcity—or imminent scarcity—regularly leads to anxiety, resentment, hostility and contentiousness. This pattern is very well understood, and has been evident throughout human history. In his book Constant Battles, for example, Steven LeBlanc, director of collections for Harvard’s Peabody Museum of Archaeology and Ethnology, notes that many ancient civilizations experienced higher levels of warfare when faced with resource shortages brought about by population growth, crop failures or persistent drought. Jared Diamond, author of the bestseller Collapse, has detected a similar pattern in Mayan civilization and the Anasazi culture of New Mexico’s Chaco Canyon. More recently, concern over adequate food for the home population was a significant factor in Japan’s invasion of Manchuria in 1931 and Germany’s invasions of Poland in 1939 and the Soviet Union in 1941, according to Lizzie Collingham, author of The Taste of War. Although the global supply of most basic commodities has grown enormously since the end of World War II, analysts see the persistence of resource-related conflict in areas where materials remain scarce or there is anxiety about the future reliability of supplies. Many experts believe, for example, that the fighting in Darfur and other war-ravaged areas of North Africa has been driven, at least in part, by competition among desert tribes for access to scarce water supplies, exacerbated in some cases by rising population levels. “In Darfur,” says a 2009 report from the UN Environment Programme on the role of natural resources in the conflict, “recurrent drought, increasing demographic pressures, and political marginalization are among the forces that have pushed the region into a spiral of lawlessness and violence that has led to 300,000 deaths and the displacement of more than two million people since 2003.” Anxiety over future supplies is often also a factor in conflicts that break out over access to oil or control of contested undersea reserves of oil and natural gas. In 1979, for instance, when the Islamic revolution in Iran overthrew the Shah and the Soviets invaded Afghanistan, Washington began to fear that someday it might be denied access to Persian Gulf oil. At that point, President Jimmy Carter promptly announced what came to be called the Carter Doctrine. In his 1980 State of the Union Address, Carter affirmed that any move to impede the flow of oil from the Gulf would be viewed as a threat to America’s “vital interests” and would be repelled by “any means necessary, including military force.” In 1990, this principle was invoked by President George H.W. Bush to justify intervention in the first Persian Gulf War, just as his son would use it, in part, to justify the 2003 invasion of Iraq. Today, it remains the basis for US plans to employ force to stop the Iranians from closing the Strait of Hormuz, the strategic waterway connecting the Persian Gulf to the Indian Ocean through which about 35 percent of the world’s seaborne oil commerce passes. Recently, a set of resource conflicts have been rising toward the boiling point between China and its neighbors in Southeast Asia when it comes to control of offshore oil and gas reserves in the South China Sea. Although the resulting naval clashes have yet to result in a loss of life, a strong possibility of military escalation exists. A similar situation has also arisen in the East China Sea, where China and Japan are jousting for control over similarly valuable undersea reserves. Meanwhile, in the South Atlantic Ocean, Argentina and Britain are once again squabbling over the Falkland Islands (called Las Malvinas by the Argentinians) because oil has been discovered in surrounding waters. By all accounts, resource-driven potential conflicts like these will only multiply in the years ahead as demand rises, supplies dwindle and more of what remains will be found in disputed areas. In a 2012 study titled Resources Futures, the respected British think-tank Chatham House expressed particular concern about possible resource wars over water, especially in areas like the Nile and Jordan River basins where several groups or countries must share the same river for the majority of their water supplies and few possess the wherewithal to develop alternatives. “Against this backdrop of tight supplies and competition, issues related to water rights, prices, and pollution are becoming contentious,” the report noted. “In areas with limited capacity to govern shared resources, balance competing demands, and mobilize new investments, tensions over water may erupt into more open confrontations.” Heading for a Resource-Shock World Tensions like these would be destined to grow by themselves because in so many areas supplies of key resources will not be able to keep up with demand. As it happens, though, they are not “by themselves.” On this planet, a second major force has entered the equation in a significant way. With the growing reality of climate change, everything becomes a lot more terrifying. Normally, when we consider the impact of climate change, we think primarily about the environment—the melting Arctic ice cap or Greenland ice shield, rising global sea levels, intensifying storms, expanding desert and endangered or disappearing species like the polar bear. But a growing number of experts are coming to realize that the most potent effects of climate change will be experienced by humans directly through the impairment or wholesale destruction of habitats upon which we rely for food production, industrial activities or simply to live. Essentially, climate change will wreak its havoc on us by constraining our access to the basics of life: vital resources that include food, water, land and energy. This will be devastating to human life, even as it significantly increases the danger of resource conflicts of all sorts erupting. We already know enough about the future effects of climate change to predict the following with reasonable confidence: \* Rising sea levels will in the next half-century erase many coastal areas, destroying large cities, critical infrastructure (including roads, railroads, ports, airports, pipelines, refineries and power plants) and prime agricultural land. \* Diminished rainfall and prolonged droughts will turn once-verdant croplands into dust bowls, reducing food output and turning millions into “climate refugees.” \* More severe storms and intense heat waves will kill crops, trigger forest fires, cause floods and destroy critical infrastructure. No one can predict how much food, land, water and energy will be lost as a result of this onslaught (and other climate-change effects that are harder to predict or even possibly imagine), but the cumulative effect will undoubtedly be staggering. In Resources Futures, Chatham House offers a particularly dire warning when it comes to the threat of diminished precipitation to rain-fed agriculture. “By 2020,” the report says, “yields from rain-fed agriculture could be reduced by up to 50%” in some areas. The highest rates of loss are expected to be in Africa, where reliance on rain-fed farming is greatest, but agriculture in China, India, Pakistan and Central Asia is also likely to be severely affected. Heat waves, droughts and other effects of climate change will also reduce the flow of many vital rivers, diminishing water supplies for irrigation, hydro-electricity power facilities and nuclear reactors (which need massive amounts of water for cooling purposes). The melting of glaciers, especially in the Andes in Latin America and the Himalayas in South Asia, will also rob communities and cities of crucial water supplies. An expected increase in the frequency of hurricanes and typhoons will pose a growing threat to offshore oil rigs, coastal refineries, transmission lines and other components of the global energy system. The melting of the Arctic ice cap will open that region to oil and gas exploration, but an increase in iceberg activity will make all efforts to exploit that region’s energy supplies perilous and exceedingly costly. Longer growing seasons in the north, especially Siberia and Canada’s northern provinces, might compensate to some degree for the desiccation of croplands in more southerly latitudes. However, moving the global agricultural system (and the world’s farmers) northward from abandoned farmlands in the United States, Mexico, Brazil, India, China, Argentina and Australia would be a daunting prospect. It is safe to assume that climate change, especially when combined with growing supply shortages, will result in a significant reduction in the planet’s vital resources, augmenting the kinds of pressures that have historically led to conflict, even under better circumstances. In this way, according to the Chatham House report, climate change is best understood as a “threat multiplier…a key factor exacerbating existing resource vulnerability” in states already prone to such disorders. Like other experts on the subject, Chatham House’s analysts claim, for example, that climate change will reduce crop output in many areas, sending global food prices soaring and triggering unrest among those already pushed to the limit under existing conditions. “Increased frequency and severity of extreme weather events, such as droughts, heat waves and floods, will also result in much larger and frequent local harvest shocks around the world….These shocks will affect global food prices whenever key centers of agricultural production area are hit—further amplifying global food price volatility.” This, in turn, will increase the likelihood of civil unrest. When, for instance, a brutal heat wave decimated Russia’s wheat crop during the summer of 2010, the global price of wheat (and so of that staple of life, bread) began an inexorable upward climb, reaching particularly high levels in North Africa and the Middle East. With local governments unwilling or unable to help desperate populations, anger over impossible-to-afford food merged with resentment toward autocratic regimes to trigger the massive popular outburst we know as the Arab Spring. Many such explosions are likely in the future, Chatham House suggests, if current trends continue as climate change and resource scarcity meld into a single reality in our world. A single provocative question from that group should haunt us all: “Are we on the cusp of a new world order dominated by struggles over access to affordable resources?” For the US intelligence community, which appears to have been influenced by the report, the response was blunt. In March, for the first time, Director of National Intelligence James R. Clapper listed “competition and scarcity involving natural resources” as a national security threat on a par with global terrorism, cyberwar and nuclear proliferation. “Many countries important to the United States are vulnerable to natural resource shocks that degrade economic development, frustrate attempts to democratize, raise the risk of regime-threatening instability, and aggravate regional tensions,” he wrote in his prepared statement for the Senate Select Committee on Intelligence. “Extreme weather events (floods, droughts, heat waves) will increasingly disrupt food and energy markets, exacerbating state weakness, forcing human migrations, and triggering riots, civil disobedience, and vandalism.” There was a new phrase embedded in his comments: “resource shocks.” It catches something of the world we’re barreling toward, and the language is striking for an intelligence community that, like the government it serves, has largely played down or ignored the dangers of climate change. For the first time, senior government analysts may be coming to appreciate what energy experts, resource analysts and scientists have long been warning about: the unbridled consumption of the world’s natural resources, combined with the advent of extreme climate change, could produce a global explosion of human chaos and conflict. We are now heading directly into a resource-shock world.

#### We are going to run out of rare earth minerals without asteroid mining.

Nafeez Ahmed, 12-12-2018, "We Don't Mine Enough Rare Earth Metals to Replace Fossil Fuels With Renewable Energy," Vice, https://www.vice.com/en/article/a3mavb/we-dont-mine-enough-rare-earth-metals-to-replace-fossil-fuels-with-renewable-energy

A new scientific study supported by the Dutch Ministry of Infrastructure warns that the renewable energy industry could be about to face a fundamental obstacle: shortages in the supply of rare metals. To meet greenhouse gas emission reduction targets under the Paris Agreement, renewable energy production has to scale up fast. This means that **global production of** several **rare earth minerals** used in solar panels and wind turbines—especially neodymium, terbium, indium, dysprosium, and praseodymium—**must grow twelvefold by 2050**

#### Two impacts.

#### Rare earth metals are needed to switch renewables and avoid the sixth mass extinction from CC.

Anthony D. Barnosky\* Affiliation, 9-15-2015, "Transforming the global energy system is required to avoid the sixth mass extinction," Cambridge Core, https://www.cambridge.org/core/journals/mrs-energy-and-sustainability/article/abs/transforming-the-global-energy-system-is-required-to-avoid-the-sixth-mass-extinction/3B926E20A730AF666D6FCB75E366B703

This study argues that the climate changes resulting from the continued burning of fossil fuels at present rates will very likely initiate extinction of many terrestrial and marine species, beginning by mid-century. Under this scenario, interactions of climate change with other well-known extinction threats promise to trigger a loss of life that has not been seen since an asteroid-strike eliminated most dinosaurs 66 million years ago. Avoiding this will require a very rapid shift of both our stationary and transportation energy sectors to carbon-neutral systems. Mass extinctions, which result in loss of at least an estimated 75% of known species over a geologically short time period, are very rare in the 540 million year history of complex life on Earth. Only five have been recognized, the most recent of which occurred 66 million years ago, ending the reign of dinosaurs and opening the door for domination of the planet eventually by humans, who have now accelerated biodiversity loss to the extent that a Sixth Mass Extinction is plausible. Accelerated extinction rates up to now primarily have been due to human-caused habitat destruction and overexploitation of economically valuable species. Climate change caused by burning of fossil fuels adds a new and critically problematic extinction driver because the pace and magnitude of change exceeds what many species have experienced in their evolutionary history, and rapid climate change multiplies the already-existing threats. Particularly at risk are regions that contain most of the world's species, such as rainforest and coral reef ecosystems. Avoiding severe losses that would commit many species to extinction by 2100 will require transforming global energy systems to carbon-neutral ones by 2050. Currently, the transformation is occurring too slowly to avoid worst-case extinction scenarios.

#### We are going to run out of energy period without switching to renewables, which also causes extinction.

Bychristina Nunez, 1-30-2019, "Renewable energy, facts and information," Environment, https://www.nationalgeographic.com/environment/article/renewable-energy

Wonder whether your state could ever be powered by 100 percent renewables? No matter where you live, scientist Mark Jacobson believes it's possible. [That vision is laid out here](https://www.nationalgeographic.com/climate-change/carbon-free-power-grid/#cover), and while [his analysis is not without critics](https://physicsworld.com/a/jacobsons-new-100-renewables-model-aims-to-rebut-critics/), it punctuates a reality with which the world must now reckon. **Even without climate change, fossil fuels are a finite resource**, and **if we want our lease on the planet to be renewed, our energy will have to be renewable.**

#### Without fossil fuels with no energy to replace them, the energy grid would shut down.

Anthony Watts, 4-23-2022, "Life After Energy: What if fossil fuels disappeared tomorrow?," Watts Up With That?, https://wattsupwiththat.com/2013/02/07/life-after-energy-what-if-fossil-fuels-disappeared-tommorrow/

[*Atlas Shrugged*](http://www.amazon.com/gp/product/0452011876?ie=UTF8&tag=wattsupwithth-20&camp=1789&creativeASIN=0452011876) is the title of Ayn Rand’s 1957 novel in which the world grinds to a halt after the productive segment of society goes on strike. Tired of being demonized and exploited, the world’s innovators and entrepreneurs simply walk away.What would happen to the US today if the fossil fuel industry went on a strike of indefinite duration? What would happen if we gave the environmentalists what they want?Within 24 hours there would be long lines at service stations as people sought to purchase remaining stocks of gasoline. The same people who denounce oil companies would be desperately scrounging the last drops of available fuel for their SUVs. By the third day, all the gasoline would be gone.With no diesel fuel, the trucking industry would grind to a halt. Almost all retail goods in the US are delivered by trucks. Grocery shelves would begin to empty. Food production at the most basic levels would also stop.With no trains or trucks running there would be no way to deliver either raw materials or finished products. All industrial production and manufacturing would stop. Mass layoffs would ensue. At this point, it would hardly matter. With virtually all transportation systems out, the only people who could work would be those who owned horses or were capable of walking to their places of employment.Owners of electric cars might smirk at first, but would soon be forced to the unpleasant reality that the vehicle they thought was “emission free” runs on coal. Forty-two percent of [electric power in the US](http://www.eia.gov/energyexplained/index.cfm?page=electricity_in_the_united_states) is produced by burning coalWith natural gas also out of the picture, we would lose another 25 percent. The environmentalist’s favorite power sources, wind and solar, could not fill the gap. Wind power currently generates about 3 percent of our electricity and solar power accounts for a scant 0.04 percent. The only reliable power sources left would be hydroelectric and nuclear. But together these two sources could only power the grid at 27 percent of its normal capacity. With two-thirds of the electric power gone, the grid would shut down entirely.

#### Without the energy grid functioning, mass death occurs.

Aaron Larson, Jul 22, 2015, 7-22-2015, "Expert: 90% of U.S. Population Could Die if a Pulse Event Hits the Power Grid," POWER Magazine, https://www.powermag.com/expect-death-if-pulse-event-hits-power-grid/

Johnson, chairman of the U.S. Senate Committee on Homeland Security & Governmental Affairs, posed questions to witnesses testifying on Capitol Hill before his committee. He asked R. James Woolsey, chairman of the Foundation for Defense of Democracies and former director of the Central Intelligence Agency, what would happen to society if the electrical grid were to be down for an extended period of time, such as a year or two, following an EMP event?

Woolsey responded, “It’s briefly dealt with in the commission report of [2008]. There are essentially two estimates on how many people would die from hunger, from starvation, from lack of water, and from social disruption. One estimate is that within a year or so, two-thirds of the United States population would die. The other estimate is that within a year or so, 90% of the U.S. population would die. We’re talking about total devastation. We’re not talking about just a regular catastrophe.”

## AT Fw

#### Universalizability is not the only way to use reason, we are just working off of different bases for what is good. Util comes first because we inherently care about pleasure and pain and we need to do reason off of that

#### Util is the only universalizable framework, allows for degrees of right and wrong and can be applied to every situation, tells me whether to eat toast or not where my opponents framework doesn’t have prescription for morally neutral actions

#### Omnilateral will is nonsensical, everyone has different thoughts and ideas there can be no universal wills, governments are closest but there are a ton of different ones throughout the world and they don’t represent all people

1. At consequences fail, can predict action and we observe past events to deduce what the future is most like, has worked in the past

## AT AFF offense

1. Senjuti Mallick and Rajeswari Pillai Rajagopalan And Senjuti Mallick, 1-24-2019, "If space is ‘the province of mankind’, who owns its resources?," ORF, https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/

The first concern is establishing clear regulations regarding asteroid mining. With an intent to establish clear regulations with respect to asteroid mining and to legalise material extraction from the moon and other celestial bodies by private companies in the US, the US government legalised space mining in 2015 by introducing the US Commercial Space Launch Competitiveness Act, 2015.[[xxvii]](https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/" \l "_edn27) This move was heartily welcomed by the private companies as it provided legitimacy to their planned activities. Subsequently in 2017, Luxembourg followed suit.[[xxviii]](https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/" \l "_edn28) While the US has been a spacefaring nation for many decades now, Luxembourg aspires to become a global leader in the nascent race to mine resources in [outer space](https://www.cnbc.com/space/). In the 1980s the tiny European nation arose out of almost nowhere to become a leader in the satellite communications industry; today it is looking to the skies again, hoping to be the Silicon Valley of asteroid mining.[[xxix]](https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/" \l "_edn29) In the backdrop of a thriving steel industry that faced trade recession during the oil crisis of 1973, Luxembourg is trying to capitalise on the potential of space mining. As Prime Minister Xavier Bettel put it, “We realized it wouldn’t be forever, the steel, so we decided to do other things.”[[xxx]](https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/" \l "_edn30) Similarly, looking beyond oil, the UAE is framing its policy approaches to make advances in two key areas: human space exploration, and commercial activities of resource extraction through mining.[[xxxi]](https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/" \l "_edn31)

## AT Advantage

#### Impact Mitigation. Private entities are working on taking down space debris. McDonald 21

Byjordan Mcdonald, 11-22-2021, "Space junk removal could become a hot new startup category," Emerging Tech Brew, https://www.emergingtechbrew.com/stories/2021/11/22/space-junk-removal-could-become-a-hot-new-startup-category

**Some satellite providers—like Starlink—deorbit their own satellites, while specialist companies like ClearSpace are sprouting up with inventive ways to collect space junk**, like using a drone-like satellite to capture space junk using a net. **One of the biggest** companies in space debris removal **is Astroscale**, which has raised over $204 million since its founding in 2013. Astroscale’s operation consists of a robotic arm called the ELSA-d, **which** connects to docking plates preinstalled on satellites, allowing the robotic arm to **bring** the **decommissioned satellites low enough into Earth’s atmosphere that they burn up upon reentry.** The company has worked with satellite broadband provider OneWeb in getting the ELSA-d in the field, outfitting at least 200 of its new satellites with Astroscale-compatible docking plates, Ron Lopez, president and managing director at Astroscale US, told us. Astroscale is also working on bringing down legacy space junk through the use of docking stations, but it takes on those contracts on a case-by-case basis. That’s because legacy objects stem from a variety of national space programs, and lack a universal size or shape as a result.

#### We only need to remove 5 high risk objects in orbit every year to stop space debris from reaching a critical mass since most debris fall out of orbit and back to earth NASA 11

National Aeronautics and Space Administration, April 2011, “An Update on LEO Environment Remediation with Active Debris Removal”, Orbital Debris Quarterly News, <https://orbitaldebris.jsc.nasa.gov/quarterly-news/pdfs/odqnv15i2.pdf>

NASA Orbital Debris Program Office on LEO environment remediation [4]. Simulations were carried out with the NASA long-term debris evolutionary model, LEGEND. The future projection part of the top curve assumes a nominal launch cycle and **a [Assuming a] 90% compliance of the postmission disposal** (PMD) **measures** (e.g., the 25-year rule). The average of 100 Monte Carlo LEGEND runs indicates that the LEO population will continue a steady increase in the next 200 years. With the addition of ADR operations of two objects per year, starting from the year 2020 (the middle curve), the population growth is approximately reduced by half. **If the** ADR **[Active debris removal] rate is increased to five objects per year, then the [amount of space debris in orbit]** LEO population **in the next 200 years can be maintained at a level similar to the current environment** (bottom curve). However, if the objective is to restore the environment back to the level prior to 1 January 2007, then a

1. **TURN. Governments don’t want to clean up this mess alone, they are relying on public-private partnerships. Giordano 21**

Miranda Katz, 10-21-2021, "Space Debris: Another Frontier in the Commercialization of Space — Columbia Journal of Transnational Law," Columbia Journal of Transnational Law, https://www.jtl.columbia.edu/bulletin-blog/space-debris-another-frontier-in-the-commercialization-of-space

In light of public policy’s silence on space debris, the initiative of actors like Astroscale involving themselves in policy may be advised, as it could promote further private investment in technology for space debris removal.**A** popular policy **recommendation among experts is the establishment of public-private partnerships, and Astroscale has entered several such agreements including with Japan and the European Space Agency.  Other actors include ClearSpace, OneWeb, and D-Orbit.**

1. **TURN. These capabilities have been working in 2021. Private sector increases debris removal and currently only private entities have active space debris removal capabilities Pultarova 21**

Tereza Pultarova, 05-26-2021, "Commercial space clean-up service could be ready in 2024," Space, https://www.space.com/commercial-space-debris-removal-2024-astroscale

**The ELSA-d spacecraft of** Japan-based startup **Astroscale [having]** has **successfully captured a** simulated **piece of space junk**, completing the first phase of a demonstration mission that could pave the way for a less cluttered future in orbit.

1. **Astroscale plans to offer full debris removal services by 2024. Pultarova 21**

Japan-headquartered space services company **Astroscale,** which recently launched its ELSA-d space debris removal demonstrator, **might be ready to start cleaning up** the mess in **Earth's orbit by 2024. The company**, which has offices in the U.K., U.S., Israel and Singapore, **has signed a** $3.5 million **deal with** would-be **megaconstellation operator OneWeb to work together on advancing debris-removal technology.** OneWeb currently operates over 180 satellites in a constellation meant to reach about 650 satellites, but has asked the U.S. Federal Communications Commission (FCC) to approve over 6,300 satellites in its "Phase Two" strategy. OneWeb is partially owned by the British government."**This partnership with OneWeb demonstrates their commitment to space sustainability and is the next step towards** maturing our technologies to develop **a full-service debris removal offering by 2024**," John Auburn, managing director of Astroscale U.K. and group chief commercial officer said in a statement.

#### Defense. No one is going to war over a downed satellite. Fear of escalation is just twitter fear-mongering, but the actual impact of satellite collision is miniscule. Bowen 18

Bleddyn Bowen, 2-20-2018, "The Art of Space Deterrence," European Leadership Network, https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/

**Space is** often **an afterthought** or a miscellaneous ancillary **in the grand strategic views of top-level decision-makers.** **A president may not care that one satellite may be lost** or go dark; **it may cause** panic and **Twitter-based** **hysteria** for the space community, of course. **But the terrestrial context and consequences, as well as the political stakes** and symbolism of any exchange of hostilities in space **matters more.** **The political and media dimension can magnify or minimise the perceived consequences of losing specific satellites out of all proportion to their actual strategic effect.**

#### TURN. Governments use private satellites for deterrence, they are key to reducing the risk of conflict. According to Mountin 14,

Sarah Mountin, 2014, “The Legality and Implications of Intentional Interference with Commercial Communication Satellite Signals,” International Law Studies, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fdigital-commons.usnwc.edu%2Fcgi%2Fviewcontent.cgi%3Farticle%3D1013%26context%3Dils&pdffilename=Legality%20of%20Interference%20with%20Commercial%20Communication%20Satellite%20Signals.pdf

Moreover, even though more than 80 percent of satellite jamming incidents historically have been precipitated by diplomatic and political differences among nations,15 jamming is increasingly being employed to control, deny and degrade information needed for strategic, economic and military purposes.16 Jamming is especially troublesome for **the U.S. military** because it **relies on dual-use commercial satellites for 80 to 90 percent of its satellite communications needs**.17 Jamming also poses challenges for States when the effects are generated within their borders or by its citizens. As this article will describe, States may be held responsible for failing to contain and constrain jamming activities under international law and “States directly menaced [by jamming] can reasonably be expected to take measures against

#### Wilson 21 explains these satellites importance,

Robert Wilson, February 2021, “More to See and More to Hide: Forecasting the Effect of Space Technology on Nuclear Weapon Issues”, “The Next Fifty Years of Nuclear Proliferation,” an Occasional Paper of the Institute for International Science & Technology Policy, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fcpb-us-e1.wpmucdn.com%2Fblogs.gwu.edu%2Fdist%2F3%2F1964%2Ffiles%2F2021%2F03%2FRobertS\_Wilson.pdf&chunk=true

Much like its nuclear forces, a country’s nuclear command, control, and communications **(NC3) is a fundamental element of its deterrent.** “When it comes to nuclear modernization, NC3 is the least expensive, yet perhaps the most critical,” says a 2019 report from the Mitchell Institute and MITRE. **“Possession of an effective and robust NC3 system**,” the report states, “**is essential for deterrence since its existence will convince potential adversaries that any attempted surprise nuclear aggression will fail and will be met with a devastating response”** (Deptula, LaPlante, and Haddick 2019). Nuclear scholar Paul Bracken notes the growing recognition of the importance of NC3: “An interesting feature of the global nuclear command and control system that is now developing is the recognition that the information regime around nuclear weapons is increasingly critical. It is critical for deterrence and for other aspects of nuclear governance” (Bracken 2020).