## P

#### Interpretation Debaters must have an entry on the NDCA 2021-2022 wiki and disclose previously read arguments, contact information, trigger warnings, or any other accommodations

#### Violation Alliance JS does not have an entry on the wiki

#### Vote negative to preserve clash – a wiki is the easiest way to disclose. Forcing me to be at the laptop and waiting for you to reach the room is a bad model of debate because it sacrifices the time needed to ensure informed pre-round prep. We don’t need to prove in round abuse for clash because we are going for a competing interpretations argument whereby, we have indicted the practices you have engaged in as bad for debate to answer this you must provide a competing model of debate that resolves the issues that you have created by not having a wiki

#### I didn’t know about the wiki is insufficient because it doesn’t answer competing interpretations comes before what exactly did happen – they can make arguments about not knowing but that doesn’t disprove that a model of having a wiki is a good idea. Voting negative forces them to create a wiki which means voting negative sends an important signal

#### There is a voter for safety without a wiki we can’t contact to avoid trigger/content warnings or ask for accommodations which makes debate an unsafe space where I can experience harm in the next round which means our model solves and the model they implicitly defend is harmful

## NC

### Contention 1 is Mining

#### Private Mining is good

#### Private space companies are the leading drivers of mining resources off celestial bodies – that’s key to stop resource, water, and rare earth mineral shortages

Gilbert 21 (Alex Gilbert; 4/26/21;The Milken Institute Review; *“Mining in Space Is Coming”*; accessed 12/15/21; <https://www.milkenreview.org/articles/mining-in-space-is-coming>; alex gilbert, is a complex systems researcher and a PhD student in space resources at the Colorado School of Mines.) HB

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 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. Start with the fact that space belongs to no country, complicating traditional methods of resource allocation, property rights and trade. With limited demand for materials in space itself and the need for huge amounts of energy to return materials to Earth, creating a viable industry will turn on major advances in technology, finance and business models. That said, there’s no grass growing under potential pioneers’ feet. Potential economic, scientific and even security benefits underlie an emerging geopolitical competition to pursue space mining. The United States is rapidly emerging as a front-runner, in part due to its ambitious Artemis Program to lead a multinational consortium back to the Moon. But it is also a leader in creating a legal infrastructure for mineral exploitation. The United States has adopted the world’s first space resources law, recognizing the property rights of private companies and individuals to materials gathered in space. However, the United States is hardly alone. Luxembourg and the United Arab Emirates (you read those right) are racing to codify space-resources laws of their own, hoping to attract investment to their entrepot nations with business-friendly legal frameworks. China reportedly views space-resource development as a national priority, part of a strategy to challenge U.S. economic and security primacy in space. Meanwhile, Russia, Japan, India and the European Space Agency all harbor space-mining ambitions of their own. Governing these emerging interests is an outdated treaty framework from the Cold War. Sooner rather than later, we’ll need new agreements to facilitate private investment and ensure international cooperation. What’s Out There Back up for a moment. For the record, space is already being heavily exploited, because space resources include non-material assets such as orbital locations and abundant sunlight that enable satellites to provide services to Earth. Indeed, satellite-based telecommunications and global positioning systems have become indispensable infrastructure underpinning the modern economy. Mining space for materials, of course, is another matter. In the past several decades, planetary science has confirmed what has long been suspected: celestial bodies are potential sources for dozens of natural materials that, in the right time and place, are incredibly valuable. Of these, water may be the most attractive in the near-term, because — with assistance from solar energy or nuclear fission — H2O can be split into hydrogen and oxygen to make rocket propellant, facilitating in-space refueling. So-called “rare earth” metals are also potential targets of asteroid miners intending to service Earth markets. Consisting of 17 elements, including lanthanum, neodymium, and yttrium, these critical materials (most of which are today mined in China at great environmental cost) are required for electronics. And they loom as bottlenecks in making the transition from fossil fuels to renewables backed up by battery storage. The Moon is a prime space mining target. Boosted by NASA’s mining solicitation, it is likely the first location for commercial mining. The Moon has several advantages. It is relatively close, requiring a journey of only several days by rocket and creating communication lags of only a couple seconds — a delay small enough to allow remote operation of robots from Earth. Its low gravity implies that relatively little energy expenditure will be needed to deliver mined resources to Earth orbit. The Moon may look parched — and by comparison to Earth, it is. But recent probes have confirmed substantial amounts of water ice lurking in permanently shadowed craters at the lunar poles. Further, it seems that solar winds have implanted significant deposits of helium-3 (a light stable isotope of helium) across the equatorial regions of the Moon. Helium-3 is a potential fuel source for secondand third-generation fusion reactors that one hopes will be in service later in the century. The isotope is packed with energy (admittedly hard to unleash in a controlled manner) that might augment sunlight as a source of clean, safe energy on Earth or to power fast spaceships in this century. Between its water and helium-3 deposits, the Moon could be the resource stepping-stone for further solar system exploration. Asteroids are another near-term mining target. There are all sorts of space rocks hurtling through the solar system, with varying amounts of water, rare earth metals and other materials on board. The asteroid belt between the orbits of Mars and Jupiter contains most of them, many of which are greater than a kilometer in diameter. Although the potential water and mineral wealth of the asteroid belt is vast, the long distance from Earth and requisite travel times and energy consumption rule them out as targets in the near term. Wannabe asteroid miners will thus be looking at smaller near-Earth asteroids. While they are much further away than the Moon, many of them could be reached using less energy — and some are even small enough to make it technically possible to tow them to Earth orbit for mining. Space mining may be essential to crewed exploration missions to Mars. Given the distance and relatively high gravity of Mars (twice that of the Moon), extraction and export of minerals to Earth seems highly unlikely. Rather, most resource extraction on Mars will focus on providing materials to supply exploration missions, refuel spacecraft and enable settlement. Technology Is the Difference The prospects for space mining are being driven by technological advances across the space industry. The rise of reusable rocket components and the now-widespread use of off-the-shelf parts are lowering both launch and operations costs. Once limited to government contract missions and the delivery of telecom satellites to orbit, private firms are now emerging as leaders in developing “NewSpace” activities — a catch-all term for endeavors including orbital tourism, orbital manufacturing and mini-satellites providing specialized services. The space sector, with a market capitalization of $400 billion, could grow to as much as $1 trillion by 2040 as private investment soars. But despite the high-profile commercial advances, governments still call the shots on the leading edge of space resource technologies. The United States extracted the first extraterrestrial materials in space from the Moon during the Apollo missions, followed by the Soviet Union’s recoveries from crewless Luna missions. President Biden recently borrowed one of the Apollo lunar rocks for display in the Oval Office, highlighting the awe that deep space can still summon. For the time being, scientific samples remain the goal of mining. Last October, NASA’s OSIRIS-REx mission — due to return to Earth in 2023 — collected a small amount of material from the asteroid Bennu. In December, Japan returned a sample of the asteroid Ryugu with the Hayabusa2 spacecraft. And several weeks later, China’s Chang’e 5 mission returned the first lunar samples since the 1970s. Sample collection is accelerating, with recent missions targeting Mars. Japan is planning to visit the two moons of Mars and extract a sample from one. NASA’s robotic Perseverance rover will collect and cache drilled samples on Mars that could later be returned to Earth. Perseverance also carries gear for the unique MOXIE experiment on Mars — an attempt to produce oxygen on the planet with technologies that could eventually extract oxygen for astronauts to breath and refuel spacecraft.

#### Prohibitions on appropriation prevent asteroid mining despite growing space industries

Myers 16 -- Ross Myers (J.D. candidate at the University of Oregon Law School.), The Doctrine of Appropriation and Asteroid Mining: Incentivizing the Private Exploration and Development of Outer Space, 2016, Oregon Review of International Law, https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/19850/Meyers.pdf?sequence=1 WJ

Despite a decrease in national space program funding, corporate space missions are on the rise. In 2010, President Obama proposed that NASA exit the business of flying astronauts from Earth to low Earth orbit and move it to private companies.52 Several companies have stepped up to bat, and corporate space programs now include space tourism, supply missions, and in one case a one-way colonization mission to Mars.53 Corporate interest in space tourism and development demonstrates a strong private commercial interest in space as an industry, which could serve to finance the exploration of space in a period where national governments do not have an active financial interest in space. However, under current international treaties, the ownership of asteroids is prohibited, preventing corporations willing to invest in asteroid mining from having a secure claim.

#### Scenario 1 is Solar Satellites

#### Asteroid mining solves climate change through solar-powered satellites – provides infrastructure for existing tech

**Faure 11** (Jamie Faure, 7-15-2011, "Can space-based solar power save the climate? – Young Scientists Journal," No Publication, <https://ysjournal.com/can-space-based-solar-power-save-the-climate/>) // VS

Introduction How shall we tackle climate change? This is still an unresolved question. Here, I will put forward an idea and argue its case. Burning fuels creates carbon dioxide, which thickens the atmosphere. Consequently, an increasing amount of the Sun’s heat is trapped. So, to tackle climate change, we must stop burning fuels. However, fuel is needed for energy. Therefore, we (can use) need to find other sources of energy that do not adversely impact the environment. Space-based Solar Power What I think has the most potential in reducing global warming is Space-based Solar Power (SBSP) . This technology involves placing solar satellites in space, where their energy production is unaffected by seasons, weather, the day and night cycle, and the filtering effect of the Earth’s atmosphere, learn more at solar the gap. The Sun’s energy for us is virtually unlimited (around 5 billion years to go). In addition, the satellites are placed nearer to the Sun in space than to the Earth, so they receive more of the Sun’s energy. The satellite then transmits power to the Earth using a laser or microwave beam. Transmission by microwaves has already been tested by NASA, and proven possible. In space, solar irradiance is 144% higher than in the Earth, which means there is a lot more power available up there! Japan has already been working on this idea for 30 years and invested over 20 billion dollars, hoping to finish their project by 2030. The Americans and the Russians are also at the breach, working on a similar idea. The problem with this solution is that we would need to make sure the laser or microwave beam is perfectly orientated toward its receptor on Earth, and would not hit planes or other satellites. Further development is needed before this method is actually feasible.

#### **Scenario 2 is green energy**

#### **Increasing the supply of rare earth metals is crucial to the transition to green tech which is key to resolve climate chnage**

Riley 21 (Charles Riley; 5/5/21; CNN; *“A shortage of these metals could make the climate crisis worse”*; accessed 12/15/21; <https://www.cnn.com/2021/05/05/business/climate-crisis-metals-shortage/index.html>; Charles Riley is Europe Editor at CNN Business. Before joining the London bureau, he worked as a reporter and editor in New Delhi, Hong Kong, New York and Washington D.C.) HB

The world won't be able to tackle the climate crisis unless there is a sharp increase in the supply of metals required to produce electric cars, solar panels, wind turbines and other clean energy technologies, according to the International Energy Agency. As countries switch to green energy, demand for copper, lithium, nickel, cobalt and rare earth elements is soaring. But they are all vulnerable to price volatility and shortages, the agency warned in a report published on Wednesday, because their supply chains are opaque, the quality of available deposits is declining and mining companies face stricter environmental and social standards. Limited access to known mineral deposits is another risk factor. Three countries together control more than 75% of the global output of lithium, cobalt and rare earth elements. The Democratic Republic of Congo was responsible for 70% of cobalt production in 2019, and China produced 60% of rare earth elements while refining 50% to 70% of lithium and cobalt, and nearly 90% of rare earth elements. Australia is the other power player. In the past, mining companies have responded to higher demand by increasing their investment in new projects. But it takes on average 16 years from the discovery of a deposit for a mine to start production, according to the IEA. Current supply and investment plans are geared to "gradual, insufficient action on climate change," it warned. "These risks to the reliability, affordability and sustainability of mineral supply are manageable, but they are real," the Paris-based agency said in the most comprehensive report on the issue to date. "How policy makers and companies respond will determine whether critical minerals are a vital enabler for clean energy transitions, or a bottleneck in the process." The minerals are essential to technologies that are expected to play a leading role in combating climate change. The average electric car requires six times more minerals than a conventional car, according to the IEA. Lithium, nickel, cobalt, manganese and graphite are crucial to batteries. Electricity networks need huge amounts of copper and aluminum, while rare earth elements are used in the magnets needed to make wind turbines work. Meeting the goals of the Paris climate agreement will require a "significant" increase in clean energy, according to the IEA, which estimates that the annual installation of wind turbines would need to grow threefold by 2040 and electric car sales would need to expand 25 times over the same period. Reaching net zero emissions by 2050 would require even more investment. "The data shows a looming mismatch between the world's strengthened climate ambitions and the availability of critical minerals that are essential to realizing those ambitions," Fatih Birol, executive director of the IEA, said in a statement. "The challenges are not insurmountable, but governments must give clear signals about how they plan to turn their climate pledges into action." The agency said that policymakers should provide more clarity on the energy transition, promote the development of new technology and recycling, enhance supply chain resilience and encourage higher environmental, social and governance (ESG) standards. The IEA, which advises the world's richest countries and was founded after the oil supply shocks in the 1970s, said that mineral supplies will be the energy security challenge of the 21st century. "Concerns about price volatility and security of supply do not disappear in an electrified, renewables-rich energy system," it said.

#### Commercial asteroidmining solves climate change

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. Th ey, 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 redefi ne 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.

**Climate change causes extinction – ocean acidification, water and resource wars, econ collapse, and regional conflicts.**

Pachauri and Meyer 15 (Rajendra K. Pachauri Chairman of the IPCC, Leo Meyer Head, Technical Support Unit IPCC were the editors for this IPCC report, “Climate Change 2014 Synthesis Report” <http://epic.awi.de/37530/1/IPCC_AR5_SYR_Final.pdf> IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp)

SPM 2.3 Future risks and impacts caused by a changing climate Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development. {2.3} Risk of climate-related impacts results from the interaction of climate-related hazards (including hazardous events and trends) with the vulnerability and exposure of human and natural systems, including their ability to adapt. Rising rates and magnitudes of warming and other changes in the climate system, accompanied by ocean acidification, increase the risk of severe, pervasive and in some cases irreversible detrimental impacts. Some risks are particularly relevant for individual regions (Figure SPM.8), while others are global. The overall risks of future climate change impacts can be reduced by limiting the rate and magnitude of climate change, including ocean acidification. The precise levels of climate change sufficient to trigger abrupt and irreversible change remain uncertain, but the risk associated with crossing such thresholds increases with rising temperature (medium confidence). For risk assessment, it is important to evaluate the widest possible range of impacts, including low-probability outcomes with large consequences. {1.5, 2.3, 2.4, 3.3, Box Introduction.1, Box 2.3, Box 2.4} A large fraction of species faces increased extinction risk due to climate change during and beyond the 21st century, especially as climate change interacts with other stressors (high confidence). Most plant species cannot naturally shift their geographical ranges sufficiently fast to keep up with current and high projected rates of climate change in most landscapes; most small mammals and freshwater molluscs will not be able to keep up at the rates projected under RCP4.5 and above in flat landscapes in this century (high confidence). Future risk is indicated to be high by the observation that natural global climate change at rates lower than current anthropogenic climate change caused significant ecosystem shifts and species extinctions during the past millions of years. Marine organisms will face progressively lower oxygen levels and high rates and magnitudes of ocean acidification (high confidence), with associated risks exacerbated by rising ocean temperature extremes (medium confidence). Coral reefs and polar ecosystems are highly vulnerable. Coastal systems and low-lying areas are at risk from sea level rise, which will continue for centuries even if the global mean temperature is stabilized (high confidence). {2.3, 2.4, Figure 2.5} Climate change is projected to undermine food security (Figure SPM.9). Due to projected climate change by the mid-21st century and beyond, global marine species redistribution and marine biodiversity reduction in sensitive regions will challenge the sustained provision of fisheries productivity and other ecosystem services (high confidence). For wheat, rice and maize in tropical and temperate regions, climate change without adaptation is projected to negatively impact production for local temperature increases of 2°C or more above late 20th century levels, although individual locations may benefit (medium confidence). Global temperature increases of ~4°C or more 13 above late 20th century levels, combined with increasing food demand, would pose large risks to food security globally(high confidence). Climate change is projected to reduce renewable surface water and groundwater resources in most dry subtropical regions (robust evidence, high agreement), intensifying competition for water among sectors (limited evidence, medium agreement). {2.3.1, 2.3.2} Until mid-century, projected climate change will impact human health mainly by exacerbating health problems that already exist (very high confidence). Throughout the 21st century, climate change is expected to lead to increases in ill-health in many regions and especially in developing countries with low income, as compared to a baseline without climate change (high confidence). By 2100 for RCP8.5, the combination of high temperature and humidity in some areas for parts of the year is expected to compromise common human activities, including growing food and working outdoors (high confidence). {2.3.2} In urban areas climate change is projected to increase risks for people, assets, economies and ecosystems, including risks from heat stress, storms and extreme precipitation, inland and coastal flooding, landslides, air pollution, drought, water scarcity, sea level rise and storm surges (very high confidence). These risks are amplified for those lacking essential infrastructure and services or living in exposed areas. {2.3.2} Rural areas are expected to experience major impacts on water availability and supply, food security, infrastructure and agricultural incomes, including shifts in the production areas of food and non-food crops around the world (high confidence). {2.3.2} Aggregate economic losses accelerate with increasing temperature (limited evidence, high agreement), but global economic impacts from climate change are currently difficult to estimate. From a poverty perspective, climate change impacts are projected to slow down economic growth, make poverty reduction more difficult, further erode food security and prolong existing and create new poverty traps, the latter particularly in urban areas and emerging hotspots of hunger (medium confidence). International dimensions such as trade and relations among states are also important for understanding the risks of climate change at regional scales. {2.3.2} Climate change is projected to increase displacement of people (medium evidence, high agreement). Populations that lack the resources for planned migration experience higher exposure to extreme weather events, particularly in developing countries with low income. Climate change can indirectlyincrease risks of violent conflicts by amplifying well-documented drivers of these conflicts such as poverty and economic shocks (medium confidence). {2.3.2} 2010 )

### Contention 2 is Innovation

#### Innovation is rising after a cruel period of stagnation due to the tech sector – the aff reverses that

Murphy ’21 Murphy, Matt. “Why a Dawn of Technological Optimism Is Breaking.” The Economist, The Economist Newspaper, 16 Jan. 2021, [https://www.economist.com/leaders/2021/01/16/why-a-dawn-of-technological-optimism-is-breaking. //](https://www.economist.com/leaders/2021/01/16/why-a-dawn-of-technological-optimism-is-breaking.%20//) Phoenix

Today a dawn of technological optimism is breaking. The speed at which covid-19 vaccines have been produced has made scientists household names. Prominent breakthroughs, a tech investment boom and the adoption of digital technologies during the pandemic are combining to raise hopes of a new era of progress: optimists giddily predict a “roaring Twenties”. Just as the pessimism of the 2010s was overdone—the decade saw many advances, such as in cancer treatment—so predictions of technological Utopia are overblown. But there is a realistic possibility of a new era of innovation that could lift living standards, especially if governments help new technologies to flourish.

In the history of capitalism rapid technological advance has been the norm. The 18th century brought the Industrial Revolution and mechanised factories; the 19th century railways and electricity; the 20th century cars, planes, modern medicine and domestic liberation thanks to washing machines. In the 1970s, though, progress—measured by overall productivity growth—slowed. The economic impact was masked for a while by women piling into the workforce, and a burst of efficiency gains followed the adoption of personal computers in the 1990s. After 2000, though, growth flagged again.

There are three reasons to think this “great stagnation” might be ending. First is the flurry of recent discoveries with transformative potential. The success of the “messenger RNA” technique behind the Pfizer-BioNTech and Moderna vaccines, and of bespoke antibody treatments, shows how science continues to empower medicine. Humans are increasingly able to bend biology to their will, whether that is to treat disease, edit genes or to grow meat in a lab. Artificial intelligence is at last displaying impressive progress in a range of contexts. A program created by DeepMind, part of Alphabet, has shown a remarkable ability to predict the shapes of proteins; last summer OpenAI unveiled GPT-3, the best natural-language algorithm to date; and since October driverless taxis have ferried the public around Phoenix, Arizona. Spectacular falls in the price of renewable energy are giving governments confidence that their green investments will pay off. Even China now promises carbon neutrality by 2060.

The second reason for optimism is booming investment in technology. In the second and third quarters of 2020 America’s non-residential private sector spent more on computers, software and research and development (R&D) than on buildings and industrial gear for the first time in over a decade. Governments are keen to give more cash to scientists (see [Briefing](https://www.economist.com/briefing/2021/01/16/the-case-for-more-state-spending-on-r-and-d)). Having shrunk for years, public R&D spending across 24 OECD countries began to grow again in real terms in 2017. Investors’ enthusiasm for technology now extends to medical diagnostics, logistics, biotechnology and semiconductors. Such is the market’s optimism about electric vehicles that Tesla’s CEO, Elon Musk, who also runs a rocket firm, is the world’s richest man.

#### Circular Economy

Taylor 22 [Dylan Taylor is a global business leader and philanthropist. He is an active pioneer in the space exploration industry as a CEO, investor, commercial astronaut thought leader and futurist. Currently, Dylan serves as Chairman & CEO of Voyager Space, a multi-national space exploration firm that acquires and integrates leading space exploration enterprises globally. He has been cited by Harvard University, SpaceNews, the BBC, Pitchbook, CNBC, CNN and others as having played a seminal role in the growth of the private space industry and is widely considered the most active private space investor in the world. As a writer and columnist, he has written several widely read pieces on the future of the space industry for SpaceNews, ROOM, The Space Review, and Space.com. As a speaker, Dylan has keynoted many of the major space conferences around the world and has appeared regularly on Bloomberg, Fox Business, and CNBC. For his influence as a global leader and his commitment to creating a positive impact on the world, the World Economic Forum recognized Dylan as a Young Global Leader in 2011 and he was named a Henry Crown Fellow of the Aspen Institute in 2014. In 2020, Dylan was recognized by the Commercial Spaceflight Federation with their top honor for business and finance, following in the footsteps of 2019’s inaugural winner, the late Paul Allen. Dylan Taylor earned an MBA in Finance and Strategy from the Booth School of Business at University of Chicago and holds a BS in Engineering from the honors college at the University of Arizona, where he graduated Tau Beta Pi and in 2018 was named Alumnus of the year. In 2013, he attended the Global Leadership and Public Policy for the 21st Century program at Harvard University, “[The Circular Economy Drives All Industries Forward](https://www.fastcompany.com/90715488/the-circular-economy-drives-all-industries-forward)”, https://www.fastcompany.com/90715488/the-circular-economy-drives-all-industries-forward ]//Sripad

Reuse, redesign, recycle, recover, reduce. Today’s five R’s of a [circular economy](https://archive.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy) (CE) —  a system based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems — are increasingly being adopted by today’s global economy.

For some, it may be a surprise that the space industry has used these principles for decades. While some may criticize the nascent space sector for being frivolous or wasteful as threats of global climate change loom, the emerging private space sector’s underlying philosophy emphasizes the renewal and regeneration of energy and materials. It’s a philosophy that could help improve life on Earth.

As private companies invest in next-generation innovations (i.e., big data, AI, additive manufacturing, and more), today’s space industry — what I’ll refer to as NewSpace — has paved the way for circular economies, highlighting the efficient use of finite resources while emphasizing sustainability.

The NewSpace sector offers a native environment for testing applications that are part of the circular economy, and eventually, those could help build a more sustainable Earth.

Closed-Loop Systems in Space Support Sustainability

[The European Space Agency’s MELiSSA](https://cordis.europa.eu/article/id/124003-closedloop-systems-used-to-keep-astronauts-alive-in-space-could-inform-circular-economy-strat) (Micro-Ecological Life Support System Alternative) spacecraft is a leading example of a [circular economy model](https://www.livingcircular.veolia.com/en/inspirations/melissa-circular-ecosystem-go-mars) in space. The idea behind MELiSSA is simple: It scales down the Earth’s ecosystem into transportable sections for space travel using a closed life-support system that recycles every waste product into goods and water. While the previous model wasn’t made independently to harness CE principles, the current iteration of the system strongly integrates this philosophy.

The 5R-compliant system converts wastes from plants and ISS crew members to resources like water, oxygen, and nitrates to fertilize more plants aboard the space station. Solid and liquid waste is also recovered and liquified using bacteria that flourish in heated environments. This liquid is then transferred into sections of the spacecraft where elements are extracted from the liquid-like bacteria and algae to ensure clean water. Not only does this system liquefy waste, but it removes fatty acids and can help speed up the nitrification process so plants can grow quicker. The entire system is integrated as such that it helps optimize solutions for each function of the system. Thanks to MELiSSA’s supersystem, solid and liquid wastes become resources for humans and plants. The redesign of the marine ecosystem onboard reduces the harmful effects of wastes by ultimately reusing these human and plant byproducts, which are later recycled into resources that recover essential layers that help support life. It is a textbook example of how a CE philosophy system works.

It also addresses complex logistical issues to support a sustainable living environment in space. The project is still ongoing after decades and its applications within this upgraded technology have shown wide-ranging benefits that extend into industries on Earth, like [automotive or smart buildings](https://www.melissafoundation.org/page/modelling-control).

Space CE Comes to Earth

MELiSSA is an impressive example of how the space industry as a whole can help advanced and developing nations, especially when it comes to furthering sustainability. MELiSSA’s capability to 100% reuse resources in space has found its way into Earth-based applications and can assist industry players in addressing SDG goals while transitioning into a more sustainable world.

An example is how MELiSSA technology is used for environmental use and protection. [Morocco’s University of Kenitra](https://www.esa.int/Enabling_Support/Preparing_for_the_Future/Space_for_Earth/How_ESA_technology_contributes_to_worldwide_water_security) provides a village with clean drinking water, thanks to an innovation based on MELiSSA technology, organic and ceramic filtering membranes. It is the same type of membrane that has been used in Antarctica since 2005 and recycles “grey water” from everyday appliances like showers and washing machines into clean water. Kenitra serves up to 1,200 citizens. The use of such technology is already popular and will become more widespread in the future.

The space industry can readily show what conditions enable such a regenerative system and replicate it across sectors worldwide. Already, closed-loop systems are implemented in high-value industries that have identified that reuse, repair, remanufacture are efficient, while recycling is for energy efficiency and reduces GHG (greenhouse gases). But benefits can help both the space sector and new generation industries, indicating how Industry 4.0 is a crucial nexus between CE and space.

An Integrated Circular Economy Framework

The space sector is uniquely positioned to play a crucial role in today’s industries and the potential for sustainability is far beyond the MELiSSA project. Once [CE and space](https://www.sciencedirect.com/science/article/pii/S0301479721005739) are fully integrated into the Industry 4.0 framework that uses big data, cloud computing, additive manufacturing, and other fundamental innovations, it will be easier for the space industry to exchange CE ideas and concepts with Earth-based industries. Now that upstream and downstream space agencies have united toward new operating models, the increasing overlap of value chains can translate into these other industries.

The integration of technologies like big data, robotics, and 3D manufacturing can together reduce costs and production and will only improve with time. SpaceX’s reusable rockets and adaption of data, as well as RocketLab’s 3D printed engines, will only scale up as the NewSpace sector grows and emphasizes the reliance on these off-the-shelf parts.

Industry 4.0 revolution is still in its infancy, but as integration progresses over the next decade, Earth’s industries will see how space’s CE principles and processes help their sectors stay efficient and grow. Likewise, Industry 4.0’s innovations will help support the space sector as it travels deeper into our galaxy, and they have the opportunity to learn from Earth’s sector how to make the most out of innovative technologies and CE programs at home.

CE principles represent a vast opportunity to implement and adapt sustainable initiatives on Earth and advance these programs in deep space exploration. The transformative environment brought in by these next-generation space technologies increases the possibility to fully realize a more sustainable and profitable space industry and economy that will eventually get us to Mars and beyond. It is a symbiotic relationship that will help major industries on and off Earth thrive and help society evolve too.

#### Aerospace innovation spills over to other industries and the tech sector as a whole

Sayol ’21 Sayol, Ignasi. “Aerospace Innovation. Pioneer towards New Horizons.” Ignasi Sayol, 4 Aug. 2021, https://ignasisayol.com/en/aerospace-innovation/. // Phoenix

During the last decade, the aerospace industry has undergone a great transformation. It has witnessed countless disruptive innovations that have materialized and laid the foundation for future developments that are already on the horizon.

The application of multisectoral technologies such as 5G, advanced satellite systems, 3D printing, Big Data, [quantum technology](https://ignasisayol.com/en/quantum-computing/), among others, has allowed to update and scale the activity of operations in the air and space. Operations that were previously considered impossible.

Aeronautics innovation includes atmosphere and outer space activity developments. Aerospace engineering consists of aeronautics and astronautics, where aerospace organizations research, design, manufacture, operate or maintain aircraft and spacecraft.

Consider that many of these sector developments have been pioneers for the later application in other branches and that many of them are now improving many business sectors and daily life. The weather forecast, GPS or satellite television are examples that depend fundamentally on space infrastructure.

On the other hand, trends in space technology (SpaceTech) are gaining ground. Combining the increase in this industry private investments and the emerge of companies focused on this sector developing new technologies that facilitate movement, operations and communications between the earth and space.

Similarly, aviation is a branch that is accelerating the technology industry rate. An important motivation to improve the way airplanes operate is strongly driven by geopolitics. Let’s not forget that aviation has the power to turn friends into enemies and vice versa.

The aerospace industry pollinates sectors towards innovation

The aerospace sector over time has traditionally been seen as one of the greatest instigators of technological change. In disciplines such as engineering, electronics, communication, the use of new materials such as metals and plastic compounds, as well as the development of more efficient and sustainable energy systems.

The aerospace industry has a strong influence on manufacturing process innovation. It serves as a testing scenario for broader developments within automation, assembly, and inspection. Aircraft manufacturing is an example of systems and assembly’s complexity, that when solved, have great implications on many other sectors.

#### Space Commercialization drives Tech Innovation in the Status Quo – it provides a unique impetus.

Hampson 17 Joshua Hampson 1-25-2017 “The Future of Space Commercialization” <https://republicans-science.house.gov/sites/republicans.science.house.gov/files/documents/TheFutureofSpaceCommercializationFinal.pdf> (Security Studies Fellow at the Niskanen Center)//Elmer

The size of the space economy is far larger than many may think. In 2015 alone, the global market amounted to $323 billion. Commercial infrastructure and systems accounted for 76 percent of that 9 total, with satellite television the largest subsection at $95 billion. The global space launch market’s 10 11 share of that total came in at $6 billion dollars. It can be hard to disaggregate how space benefits 12 particular national economies, but in 2009 (the last available report), the Federal Aviation Administration (FAA) estimated that commercial space transportation and enabled industries generated $208.3 billion in economic activity in the United States alone. Space is not just about 13 satellite television and global transportation; while not commercial, GPS satellites also underpin personal navigation, such as smartphone GPS use, and timing data used for Internet coordination.14 Without that data, there could be problems for a range of Internet and cloud-based services.15 There is also room for growth. The FAA has noted that while the commercial launch sector has not grown dramatically in the last decade, there are indications that there is latent demand. This 16 demand may catalyze an increase in launches and growth of the wider space economy in the next decade. The Satellite Industry Association’s 2015 report highlighted that their section of the space economy outgrew both the American and global economies. The FAA anticipates that growth to 17 continue, with expectations that small payload launch will be a particular industry driver.18 In the future, emerging space industries may contribute even more the American economy. Space tourism and resource recovery—e.g., mining on planets, moons , and asteroids—in particular may become large parts of that industry. Of course, their viability rests on a range of factors, including costs, future regulation, international problems, and assumptions about technological development. However, there is increasing optimism in these areas of economic production. But the space economy is not just about what happens in orbit, or how that alters life on the ground. The growth of this economy can also contribute to new innovations across all walks of life. Technological Innovation Innovation is generally hard to predict; some new technologies seem to come out of nowhere and others only take off when paired with a new application. It is difficult to predict the future, but it is reasonable to expect that a growing space economy would open opportunities for technological and organizational innovation. In terms of technology, the difficult environment of outer space helps incentivize progress along the margins. Because each object launched into orbit costs a significant amount of money—at the moment between $27,000 and $43,000 per pound, though that will likely drop in the future —each 19 reduction in payload size saves money or means more can be launched. At the same time, the ability to fit more capability into a smaller satellite opens outer space to actors that previously were priced out of the market. This is one of the reasons why small, affordable satellites are increasingly pursued by companies or organizations that cannot afford to launch larger traditional satellites. These small 20 satellites also provide non-traditional launchers, such as engineering students or prototypers, the opportunity to learn about satellite production and test new technologies before working on a full-sized satellite. That expansion of developers, experimenters, and testers cannot but help increase innovation opportunities. Technological developments from outer space have been applied to terrestrial life since the earliest days of space exploration. The National Aeronautics and Space Administration (NASA) maintains a website that lists technologies that have spun off from such research projects. Lightweight 21 nanotubes, useful in protecting astronauts during space exploration, are now being tested for applications in emergency response gear and electrical insulation. The need for certainty about the resiliency of materials used in space led to the development of an analytics tool useful across a range of industries. Temper foam, the material used in memory-foam pillows, was developed for NASA for seat covers. As more companies pursue their own space goals, more innovations will likely come from the commercial sector. Outer space is not just a catalyst for technological development. Satellite constellations and their unique line-of-sight vantage point can provide new perspectives to old industries. Deploying satellites into low-Earth orbit, as Facebook wants to do, can connect large, previously-unreached swathes of 22 humanity to the Internet. Remote sensing technology could change how whole industries operate, such as crop monitoring, herd management, crisis response, and land evaluation, among others. 23 While satellites cannot provide all essential information for some of these industries, they can fill in some useful gaps and work as part of a wider system of tools. Space infrastructure, in helping to change how people connect and perceive Earth, could help spark innovations on the ground as well. These innovations, changes to global networks, and new opportunities could lead to wider economic growth.

#### Strong Innovation solves Extinction.

Matthews 18 Dylan Matthews 10-26-2018 “How to help people millions of years from now” <https://www.vox.com/future-perfect/2018/10/26/18023366/far-future-effective-altruism-existential-risk-doing-good> (Co-founder of Vox, citing Nick Beckstead @ Rutgers University)//Re-cut by Elmer

If you care about improving human lives, you should overwhelmingly care about those quadrillions of lives rather than the comparatively small number of people alive today. The 7.6 billion people now living, after all, amount to less than 0.003 percent of the population that will live in the future. It’s reasonable to suggest that those quadrillions of future people have, accordingly, hundreds of thousands of times more moral weight than those of us living here today do. That’s the basic argument behind Nick Beckstead’s 2013 Rutgers philosophy dissertation, “On the overwhelming importance of shaping the far future.” It’s a glorious mindfuck of a thesis, not least because Beckstead shows very convincingly that this is a conclusion any plausible moral view would reach. It’s not just something that weird utilitarians have to deal with. And Beckstead, to his considerable credit, walks the walk on this. He works at the Open Philanthropy Project on grants relating to the far future and runs a charitable fund for donors who want to prioritize the far future. And arguments from him and others have turned “long-termism” into a very vibrant, important strand of the effective altruism community. But what does prioritizing the far future even mean? The most literal thing it could mean is preventing human extinction, to ensure that the species persists as long as possible. For the long-term-focused effective altruists I know, that typically means identifying concrete threats to humanity’s continued existence — like unfriendly artificial intelligence, or a pandemic, or global warming/out of control geoengineering — and engaging in activities to prevent that specific eventuality. But in a set of slides he made in 2013, Beckstead makes a compelling case that while that’s certainly part of what caring about the far future entails, approaches that address specific threats to humanity (which he calls “targeted” approaches to the far future) have to complement “broad” approaches, where instead of trying to predict what’s going to kill us all, you just generally try to keep civilization running as best it can, so that it is, as a whole, well-equipped to deal with potential extinction events in the future, not just in 2030 or 2040 but in 3500 or 95000 or even 37 million. In other words, caring about the far future doesn’t mean just paying attention to low-probability risks of total annihilation; it also means acting on pressing needs now. For example: We’re going to be better prepared to prevent extinction from AI or a supervirus or global warming if society as a whole makes a lot of scientific progress. And a significant bottleneck there is that the vast majority of humanity doesn’t get high-enough-quality education to engage in scientific research, if they want to, which reduces the **odds that we have enough trained scientists to come up with the breakthroughs** we need as a civilization to survive and thrive. So maybe one of the best things we can do for the far future is to improve school systems — here and now — to harness the group economist Raj Chetty calls “lost Einsteins” (potential innovators who are thwarted by poverty and inequality in rich countries) and, more importantly, the hundreds of millions of kids in developing countries dealing with even worse education systems than those in depressed communities in the rich world. What if living ethically for the far future means living ethically now? Beckstead mentions some other broad, or very broad, ideas (these are all his descriptions): Help make computers faster so that people everywhere can work more efficiently Change intellectual property law so that technological innovation can happen more quickly Advocate for open borders so that people from poorly governed countries can move to better-governed countries and be more productive Meta-research: improve incentives and norms in academic work to better advance human knowledge Improve education Advocate for political party X to make future people have values more like political party X ”If you look at these areas (economic growth and technological progress, access to information, individual capability, social coordination, motives) a lot of everyday good works contribute,” Beckstead writes. “An implication of this is that a lot of everyday good works are good from a broad perspective, even though hardly anyone thinks explicitly in terms of far future standards.” Look at those examples again: It’s just a list of what normal altruistically motivated people, not effective altruism folks, generally do. Charities in the US love talking about the lost opportunities for innovation that poverty creates. Lots of smart people who want to make a difference become scientists, or try to work as teachers or on improving education policy, and lord knows there are plenty of people who become political party operatives out of a conviction that the moral consequences of the party’s platform are good. All of which is to say: Maybe effective altruists aren’t that special, or at least maybe we don’t have access to that many specific and weird conclusions about how best to help the world. If the far future is what matters, and generally trying to make the world work better is among the best ways to help the far future, then effective altruism just becomes plain ol’ do-goodery.

### Framework

#### The standard is maximizing expected wellbeing.

#### 1] Death is bad and outweighs – a] agents can’t act if they fear for their bodily security which constrains every ethical theory, b] it destroys the subject itself – kills any ability to achieve value in ethics since life is a prerequisite which means it’s a side constraint since we can’t reach the end goal of ethics without life

#### 2] Specifically, extinction outweighs – magnitude, irreversibility, uncertainty.

MacAskill 14 [William MacAskill, Associate Professor in Philosophy and Research Fellow at the Global Priorities Institute, University of Oxford, “Normative Uncertainty,” 2014, University of Oxford PhD Thesis, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.677.4121&rep=rep1&type=pdf]

However, even if we believe in a moral view according to which human extinction would be a good thing, we still have strong reason to prevent near-term human extinction. To see this, we must note three points. First, we should note that the extinction of the human race is an extremely high stakes moral issue. Humanity could be around for a very long time: if humans survive as long as the median mammal species, we will last another two million years. 188 On this estimate, the number of humans in existence in the future, given that we don’t go extinct anytime soon, would be 2×10^14. 189 So if it is good to bring new people into existence, then it’s very good to prevent human extinction.

Second, human extinction is by its nature an irreversible scenario. If we continue to exist, then we always have the option of letting ourselves go extinct in the future (or, perhaps more realistically, of considerably reducing population size). But if we go extinct, then we can’t magically bring ourselves back into existence at a later date.

Third, we should expect ourselves to progress, morally, over the next few centuries, as we have progressed in the past. So we should expect that in a few centuries’ time we will have better evidence about how to evaluate human extinction than we currently have.

#### 3] Pleasure and pain are the starting point for moral reasoning – they’re our baseline desires and the only things that explain the intrinsic value of objects or actions. That means subjective forces like justive or injustice are immeasurable and cannot be what we center in this debate

Moen 16 [Ole Martin Moen, Professor of Ethics at Oslo Metropolitan University, “An Argument for Hedonism,” 2016, *The Journal of Value Inquiry*, Vol. 50, pp. 267-281, 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.

## AC

### Contention 1

#### The speculate about the quality of work in private space entities but that injustice is clearly inevitable absent government regulation. Space privatization and appropriation doesn’t uniquely cause the injustive these workers face you said it yourself you don’t get to argue about the existence of private space companies but this is a condition of space companies existence there is no unique reason why appropriation result in this injustice

#### They also speculate about workers in space colonies which isn’t something you should get to say happens without any evidence

#### Your Bivens and wellers evidence argues that better workers rights are good for stability not that poor condition are bad for the economy. Which means ending private appropriation of space cant really do anything to change the economy

#### No Impact to the economy stuff why is it good?

### Contention 2

#### Government Contracts, regulation, and licensing all prove that governments themselves get to distribute it and that no monopoly is formed that’s just how appropriation works and even if private entities cant public entities can cause a monopoly on these “things” they have just said resources and their overall vagueness means you should grant me new arguments in the next speech

They have no internal link to why this hurts economic stability which means their only argument here is wealth concentration no reason why its bad or unfair

### Contention 3

#### MAD deters warfare because even with a risk interstate communication still exists. They don’t even have a scenario about who will target what country its way to outlandish

#### Property legitimacy isn’t immediately tested by warfare its impossible to say that it is

#### Private appropriation isn’t a violation as the OST only applies to public entities not private entities which means they don’t violate any preexisting legislation

#### 2]Countries don’t have any reason to go to war because of things in space since it doesn’t effect them here.

#### 3] Priavte entities recognize they need to persevre space or else they all lose so they work together

#### 4]It's too expensive and complicated and blows back on the aggressor---they’ll pick other means, like targeting ground-based stations

Rich **Wordsworth 15**, Writer for WIRED, VICE, Gizmodo, Kotaku, “Why We'll Never Fight a Real-Life Star Wars Space Conflict”, Gizmodo, 12/18/2015, https://www.gizmodo.co.uk/2015/12/why-well-never-fight-a-real-life-star-wars-space-conflict/

So Why Won’t It Happen?

Well, never say never. You might not make to the end of this paragraph before the sky lights up and the world goes dark. But there are some **good reasons** to be **optimistic** that won’t happen.

One reassuring factor is that the more other countries develop their militaries, the more dependent on networks they become as well. China is developing its own drone programme, and so is Russia, which will both presumably be **dependent** on **sat**ellite**s** to operate. And the more their (and our) economies and business interests develop, the more everyone will rely on satellites to further their **economic ambitions**. In the event that countries were to start knocking out each other’s satellites on a large scale, the consequences **across the board – for everyone** – would be disastrous.

It would also be **expensive** in the short term. Getting things into orbit – peaceful or otherwise – still **isn’t cheap**, which is why only a handful of countries regularly do so. And if you want to blow up a network of many satellites today (as you would have to in a first strike, to ensure other satellites couldn’t pick up the slack), launching small satellites or missiles into orbit is the **only practical way** to do that – arming satellites with their own weaponry **just isn’t financially or technologically feasible** on a grand scale. We are, happily, a **long way** from a Death Star.

“I don’t think [a large first strike] would be financially too costly [if you’re] thinking about kinetic energy weapons and the air-based or ground-based lasers,” says Jasani. “It’s viable. But if you say, ‘I’m going to put an [ASAT] weapon [permanently] in orbit’, we are then getting into **very expensive** and **very complicated** technology. So my guess is that in the foreseeable future, what we are going to focus on are the kinetic energy weapons and possibly lasers that could blind satellites or affect, for example, the solar panels. That kind of technology will be delivered in the foreseeable future, rather than having lasers in orbit [like] the Star Wars kind of thing.”

But there’s another, possibly even more persuasive reason that a kinetic war in space may not happen: it’s just so much easier – and less damaging – to mess with satellites without getting close to them.

“Jamming from the ground is not difficult,” says Quintana. “If you look at the Middle East, pick a country where there’s a crisis and the chances are that the military in that country has tried to jam a commercial satellite to try and avoid satellite TV channels broadcasting anti-government messages.”

“My guess is that by the time we are ready for space warfare, I think you may not be banking on your hit-to-kill ASATs, but more on [non-destructive] high-energy laser-based systems,” Jasani agrees. “[Space debris] affects all sides, not just the attacked side. The attacking side will have its own satellites in orbit, which might be affected by the debris [of its own attack].”

And if you really need to remove an enemy’s **sat**ellite coverage, you can always try to flatten or hack the control stations on the ground, leaving the satellites talking with no-one to listen.

“I **don’t think** physically blowing things up from the ground is something that people are looking at again,” says Quintana. “Countries and governments try to find means **other** than physical conflict to achieve their strategic ends. So as space becomes **more commercial and more civilian** and as more scientific satellites go up, then you’ll find that states will not seek to directly attack each other, but will seek **other means**.

“It may just be that they will try to cyber-attack the satellites and take them over, which has been done in the past. It’s much easier to physically or cyber-attack the ground control station than it is to attack the satellite itself - so why would you not look to do that as a first port of call and achieve the same ends?”

Ultimately, then, what might **keep us safe** from a war in space isn't the horror of explosives in orbit, but a question of **cost** and **convenience**.