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#### Interpretation: “appropriation of outer space” means to have exclusive control over

TIMOTHY JUSTIN TRAPP, JD Candidate @ UIUC Law, ’13, TAKING UP SPACE BY ANY OTHER MEANS: COMING TO TERMS WITH THE NONAPPROPRIATION ARTICLE OF THE OUTER SPACE TREATY UNIVERSITY OF ILLINOIS LAW REVIEW [Vol. 2013 No. 4]

The issues presented in relation to the nonappropriation article of the Outer Space Treaty should be clear.214 The ITU has, quite blatantly, created something akin to “property interests in outer space.”215 It allows nations to exclude others from their orbital slots, even when the nation is not currently using that slot.216 This is directly in line with at least one definition of outer-space appropriation.217 [\*\*Start Footnote 217\*\*Id. at 236 (“Appropriation of outer space, therefore, is ‘the exercise of exclusive control or exclusive use’ with a sense of permanence, which limits other nations’ access to it.”) (quoting Milton L. Smith, The Role of the ITU in the Development of Space Law, 17 ANNALS AIR & SPACE L. 157, 165 (1992)). \*\*End Footnote 217\*\*]The ITU even allows nations with unused slots to devise them to other entities, creating a market for the property rights set up by this regulation.218 In some aspects, this seems to effect exactly what those signatory nations of the Bogotá Declaration were trying to accomplish, albeit through different means.219

#### Violation – Satellite usage is NOT exclusive control or use

Johnson 20[Christopher D. Johnson 2020, Secure World Foundation"The Legal Status of MegaLEO Constellations and Concerns About Appropriation of Large Swaths of Earth Orbit" No Publication, https://swfound.org/media/206951/johnson2020\_referenceworkentry\_thelegalstatusofmegaleoconstel.pdf]/ISEE

This Does Not Constitute Possession, or Ownership, or Occupation The use of LEO by satellite constellations is substantially similar to the use of GSO, and therefore permissible. In each region, individual actors are given permission - either from a national administrator or from an international governing body (the ITU) via a national administer–to use precoordinated subsections of space. In a way that is overwhelmingly similar to the use of orbital slots in GSO, the placement of spacecraft into orbits in LEO or higher orbits does not constitute possession, ownership, or occupation of those orbits. This is because States (and their companies) have been occupying orbital slots in GSO for decades, and these uses of GSO have never been accused of “appropriating” GSO. The users have never claimed to be appropriating GSO, and their exercising of rights to use GSO is respected by other actors in the space domain. This is the same situation for other orbits, including LEO and other non-Geostationary orbits. And while GSO locations are relatively stable (subject to space weather and other perturbations, and require stationkeeping), spacecraft in LEO are actually moving through space and are not stationary, so it is even more difficult to see this use by constellations as occupation, much less appropriation. Moreover, Space Situational Awareness (SSA) and Space Traffic Management (STM) will allow other uses to use these orbits, and nothing about the use of any one user necessarily precludes others. Lastly, there is no intention by operators of constellations to exclusively occupy, must less possess or appropriate, these orbits. Would not the appropriation of outer space be an intentional, volutional act? No such intention can be found in the operators of global constellations.

#### Limits --- any other model of the topic is massive and just allows aff’s to have something to do with space and private entities --- appropriation is the ONLY limiting word in the topic --- Intent to exclude AND contextual topic wording means you err heavily NEG

#### Voter for fairness and education.

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#### Thus, resolved: The appropriation of outer space by private entities is unjust except for PIXXEL.

#### **PIXXEL is key to accurate enviro monitoring.**

Billington 21[Francesca Billington, She graduated from Princeton in 2019 with a degree in anthropology.March 17, 2021, "Pixxel Promises to Deliver the World's Highest Resolution Satellite Images," dot.LA, https://dot.la/hyperspectral-imaging-2651120389.html]/ISEE

With plans to launch the world's highest resolution earth imaging satellite, Pixxel emerged from stealth mode on Wednesday. The constellation — once deployed — will give 24-hour global coverage to generate data that could be used by agriculture companies and governments to monitor environmental conditions on Earth. "We are very excited to finally speak about what we are building at Pixxel," said co-founder and CEO Awais Ahmed in a statement. "This enables us to capture some of the richest imagery that's ever been beamed down to earth." Backed by Omnivore VC, Techstars and a roster of previous investors, the Los Angeles and Bangalore-based startup also announced a $7.3 million seed round, an extension of its $5 million boost last August. The two-year-old company got its start through the Techstars Starburst Space accelerator. Using hyperspectral imaging, the startup said its satellites can cheaply collect more detailed images to help experts working across agriculture, energy and environmental conservation. The data will be aimed at governments, as well as agriculture and oil companies that need to keep an eye on environmental factors impacting their land. The imaging is designed to pick up on issues "invisible to today's satellites," the company said, allowing it to flag pest infestations and crop diseases, or detecting oil spills and gas leaks. The first satellite is slated to launch and orbit within the next few months. "These hyperspectral satellites will allow society to tackle many of humanity's most pressing issues," Ahmed said. "Empowering humans to see the earth like never before." The company has so far partnered with the Indian Space Research Organization, the U.S. Air Force and NASA's Jet Propulsion Laboratory.

**Sats are critical towards solving climate change**

**Freedman, 9-4** (Andrew Freedman is a climate and energy reporter for Axios, covering climate change and holds a Masters in Law and Diplomacy from the Fletcher School at Tufts University, and a Masters in Climate and Society from Columbia University, 9-4-2021, accessed on 9-4-2021, Axios, "Space will be even more critical to climate science in 2051", https://www.axios.com/space-critical-to-climate-science-2051-0361889a-5ae9-47eb-960f-e83f1b6779c7.html, HBisevac)

A growing constellation of satellites that can peer deep beneath the Earth's surface, track global sea level rise in unprecedented detail, and trace pollutants in the air will **bolster climate science** in the coming decades. Why it matters:The next few decades are critical for determining the pace and severity of climate change, and efforts to deploy new technologies to cut emissions to net negative numbers will require **new planetary monitoring capabilities**. Precise measurements of sea level rise, ocean currents and changes in ice sheet elevation can also alert us to the triggering of potentially **devastating tipping points** in the climate system. What's happening:The U.S., Europe, India and China are planning their next generation of weather and climate satellites. Private companies and nonprofits, such as Planet, IceEye and Carbon Mapper, are also playing a growing role — providing data to companies and to governments. The big picture:By 2050, assuming current Earth-observing platforms continue into the future, climate researchers will have... Nearly 70 years of reliable data on sea level rise. More than 80 years of records on land use change. More than 60 years of monitoring mass changes in polar ice sheets as well as the depletion of groundwater aquifers, and more. What's next:The list of Earth-sensing satellites NASA plans to launch in the next decade reflects the **ongoing need** to monitor conditions that affect climate change. These include getting a better idea of the role that aerosols, which are tiny particles of various sources — from sea spray to airborne dust and pollutants —are playing in warming or cooling the globe. How aerosols are affecting clouds is one of the biggest uncertainties involved in future climate projections, NASA’s chief climate adviser Gavin Schmidt tells Axios. One component of NASA’s suite of next generation of Earth science satellites, collectively known as the Earth System Observatory, will focus on aerosols. Another NASA satellite, NISAR, which is being completed in collaboration with the Indian Space Research Organisation (ISRO), will be able to measure minute changes in Earth’s surface, including ice sheet movement, volcanic activity and earthquakes.“It’s **absolutely key** for mapping the vertical land component of sea level rise at any one place,” Schmidt says, noting cities that are sinking as seas are rising, like Jakarta, would benefit from this information. NASA is also planning a mission to study the land surface, including vegetation of the planet, and a new gravity-sensing mission to keep tabs on melting ice sheets.

#### It's the only method of effective mitigation

**Hassani et al., 19** (Hossein Hassani does computer science and engineering at University of Kurdistan Hewlêr, Xu Huang is the chair professor of the Department of Management and associate dean and program director of the School of Business at Hong Kong Baptist University, and Emmanuel Silva is the recipient of a BSc (Hons) Economics and Actuarial Science, an MSc Risk Management from the University of Southampton, and a Ph.D. in Statistics from the Bournemouth University and is recognized as a Fellow of the Higher Education Academy in the UK, 2-2-2019, accessed on 9-27-2021, Big Data and Cognitive Computing, "Big Data and Climate", doi: 10.3390/bdcc3010012, HBisevac)

Big data analytics have been rapidly developing along with the emerging needs of big data technologies in numerous subjects (see, for example, [1,2]). **The accessibility, availability and exponentially growing quantity of big data have further promoted the corresponding technological advancements and practical implementations**. Earth is a complex dynamical system [3]; thereafter, big data analytics encountered more challenges in climate science than other subjects regardless of the extensive resources of big climate data. Climate change as an emerging topic and also a data-intensive subject has been the research focus of big data scholars over the past several decades [4,5]. Exhaustive big data analytics applications have been carried out on big climate data, while the Internet of Things, cloud computing, big data tools to investigate climate, as well as intelligent analytics platforms and new technological progressions, have further emphasized its significance and possible impacts on climate science and big data science development (see, for example, [6,7]). Given the context of combating climate change, existing research has applied big data analytics in mainly the aspects of energy efficiency, intelligent agriculture, smart urban planning, weather forecast, natural disaster management, etc. Although overall this is not a new subject and there is a large amount of existing literature, there is no recent review to the best of our knowledge that particularly investigates the topic of big data in climate change, not to mention that the novel developments are progressing rapidly everyday along with the technological advancements. Therefore, this paper contributes to the existing literature by providing the most up-to-date overview of big data applications in climate change related studies at a glance with the most recently published research that reflects the cutting edge of this topic. It is of note that over 80% of the listed applications are after 2016, which makes this review the latest comprehensive review of big data in climate change that is significantly different from the previously existing literature. This paper also contributes by serving as the one stop directory for researchers to gain the most up-to-date overview of this topic. Furthermore, we aim to summarize the popular practice court of research in this domain, and also seek to identify the non-mainstream applications that lack thorough exploration. It is expected that, by providing this comprehensive review, both researchers and practitioners can gain better knowledge of the current research trend and identify the research gaps with valuable potential. As can be seen in Figure 1, it is identified that the applications of big data in climate change have two fundamental elements: the big climate data resources and the big data analytics techniques. We classify these studies by means of value creation as well as the specific topic of application. For convenient access of applications and clear guiding purposes, it is summarized that big data in climate change mainly function in four aspects of value creation: observing and monitoring, understanding, and predicting and optimizing, whilst the applications are grouped into five topics: energy efficiency and intelligence; smart farming and agriculture and forestry; sustainable urban planning and infrastructure; natural disaster and disease assessment; and other advanced supports. The remainder of this review paper is organized such that the values of big data to climate change study are summarized in Section 2 along with the trends of this focused topic. Section 3 lists a detailed review of the big data applications in climate change studies by topics. Finally, the paper concludes in Section 4 with current challenges and directions of future research.

2. Values of Big Data to Climate Change Study

2.1. Observing and Monitoring

One of the insights big data can bring is thoroughly revealing the realities from the large volume of data recorded. The exceptionally large sources of data contain **significantly useful information** and is also the fundamental asset of big data analyses. Monitoring the climate system is critical for better understanding the interactions within the system and its drives, respectively. Moreover, it is also beneficial for us to know the changes that may occur due to the global warming [3]. Thereafter, observing and monitoring can be considered as the **fundamental value** that big data brings along when it is incorporated with climate change study. In order to obtain thorough observation and comprehensive parameters of climate change, **earth observation technology** has played a **significant part** over the past decades [8]. A multi-dimensional big data system has been established and is still promptly developing, which has enabled us to observe and monitor changes on a global scale of **diverse earth and climate parameters**. According to [3], the climate data have generally four different sources: in situ, remote sensed, model output and paleoclimatic. A more detailed review of the climate data sources and corresponding features can be found in [9]. Later, Guo et al. [8] has thoroughly reviewed the Earth observation big data sources and relevant programs; for instance, the satellites that are working in climate change research and their functions, the remotely sensed oceanographic parameters and representative sensors, the essential climate variables by the United Nations Framework Convention on Climate Change, the atmospheric parameters by different international agencies, etc. Specifically, Sun et al. [10] provided a review of the global precipitation data sets regarding its sources and comparisons.

2.2. Understanding, Predicting and Optimizing

In the context of the nature of climate science, which investigates the tremendous global scale changes of various observations/parameters, its 3Hs feature (high dimension, high complexity and high uncertainty) has made it a great playground for big data researchers to explore and analyse even before proceeding to data mining. Besides the building up the multidimensional system of collecting and monitoring climate change, big data has also promoted the rapid progression of data-intensive analytics in climate change related studies. Here, we briefly categorizes them into the aspects of understanding, predicting and optimizing. Understanding the big data (or data empathy) according to [3]) is a challenging task considering its 5Vs feature (volume, variety, velocity, veracity and value), revealing the hidden valuable information from big data requires adequate knowledge of the purposes of corresponding data as well as the techniques/methods for collecting the data. As a trending and emerging topic, big data researchers who are also interested in climate sciences have been exposed to abundant established resources, for instance, the Global Climate Observing System (GCOS), Earth System Grid Federation (esgf.llnl.gov), the National Center for Atmospheric Research (ncar.ucar.edu), United Nations Global Pulse (unglobalpulse.org), the Climate Data Guide (climatedataguide.ucar.edu), NASA Global Climate Change (climate.nasa.gov), the NASA Center for Climate Simulation (nccs.nasa.gov) and many other international and national climate monitoring and analysing institutions over the world. A detailed report that introduces the core of global scale climate research and cyber-infrastructure can be found in [11]. The abundant resources above have enabled us to gain knowledge of what the big climate data are how the data are collected, and what the data can be used for. However, these barely scratch the surface of big data analytics. Big data have also been playing a **vital role in predicting when it is incorporated with climate science**, for instance weather forecasting, natural disasters monitoring and early warning, energy consumption forecasting, traffic forecasting, etc. By applying corresponding data mining techniques (the detailed introduction of data mining techniques can be found in [12,13]), it allows knowledge discovery of the potential relationships and causal inferences, which further contribute to the modelling and predicting [14]. Accurate forecasts can aid in adaptive policy making in relation to climate changes, whilst the value creation feature of big data puts emphasis on optimizing. Being able to understand and predict based on sufficient knowledge extracted from big data or drawing inferences across different cases/applications are relatively straightforward. However, **optimization requires comprehensive theoretical understanding as well as adequate big data** analytics skills to structure the optimal model/infrustructure so as to maximise performance, efficiency and utility, or, in some cases, for achieving sustainable development. In recent years, exhaustive relevant applications have been carried out on energy efficiency management, natural resource management, smart grid, smart farming, etc. More details of applications are provided in Section 3

#### Cross apply warming stuff from case

#### **Yes we compete!**

Arakali 21[Harichandan Arakali,Technology Editor at Forbes India, 12-15-2021, "Forbes India," Forbes India, https://www.forbesindia.com/article/take-one-big-story-of-the-day/indian-space-startups-ready-for-take-off-in-2022/72217/1]/ISEE

Awais Ahmed has come a long way from the astronomy book, and later a telescope, his father gave him as a schoolboy. If all goes as planned, the first demonstration satellite at Pixxel, the satellite data company that Ahmed and his friend Kshitij Khandelwal started in 2019, will be launched atop an Isro (Indian Space Research Organisation) rocket to an orbit some 500 km above Earth as early as January 2022. If that satellite—named Anand to honour the memory of a young intern at Pixxel, who passed away later—proves a success, demonstrating the ‘hyper-spectral’ imaging technology that the company has developed, it will help Pixxel push ahead with its plan of putting up a constellation of 36 micro satellites in what are called low-Earth orbits. Typically in the range of 500 to 550 km above Earth. “The plan is to have a constellation of satellites that can do global coverage on an every day basis so that we are able to see how things are changing daily,” Ahmed tells Forbes India. “In that process, our first satellite has been built, it has been tested, it's ready to launch… we are just waiting for the Isro rocket to get on the launch pad.” Ahmed hopes that in January 2022, Bengaluru’s Pixxel will be able to send it up. And following that, the plan is to launch the first phase of the constellation before the end of the year, which will help the startup to start serving customers around the world. Pixxel is among a clutch of startups coming up in India that reflect the coming together of multiple factors that are set to usher in the private space industry in India—a sector dominated in the country so far by the phenomenal work

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#### Innovation high now but aff trades off

Raghavan 21[Seetha Raghavan, Seetha Raghavan is a professor in UCF’s Department of Mechanical and Aerospace Engineering. 8-4-2021, "The Impact of Innovation in the New Era of Space Exploration," University of Central Florida News | UCF Today, https://www.ucf.edu/news/the-impact-of-innovation-in-the-new-era-of-space-exploration/]/ISEE

Every once in a while, a confluence of discoveries, events and initiatives results in a breakthrough so significant that it propels the entire world to a higher level, redefining what is possible in so many different fields. This breakthrough is taking centerstage now, as the new era of space exploration — catalyzed by increasing launch access — dawns upon us. The surge of innovation that comes with this will create new opportunities and inspire the next generation of doers. When this happens, boundaries between scientific and social impact are blurred. Innovation leading to scientific discovery can benefit society in the same way that social innovation can diversify and support scientific innovators, who can contribute to global progress. To ride this wave of progress, we must all participate and innovate in the new era of space exploration. The intersection of space exploration, innovation and impact isn’t a new phenomenon. In the past, technology developments and spin-offs from space research have consistently found their way into communities worldwide sometimes with lifesaving benefits. The International Space Station supports experiments that have led to discoveries and inventions in communication, water purification, and remote guidance for health procedures and robotic surgeries. Satellite-enabled Earth observation capabilities that monitor natural disasters, climate and crops often support early warnings for threats and mitigation strategies. Space exploration has always been relevant to everyone no matter the discipline or interest. Commercialization of space has been key in many ways to the current boost in “firsts” over the last few years. It has spurred innovation in launch vehicles and related technologies that led to firsts in vertical-takeoff-vertical landing rocket technology, reusability of rocket boosters and privately developed crewed missions to orbit. Concurrently, NASA has continued to captivate our imagination with the first flight of a helicopter in another world, a mission to return an asteroid sample to Earth and sending a probe to make the closest ever approach to the sun. While we celebrate the scientific progress, there is a vastly important question that we all need to focus on: How can we drive the surge in innovation offered by increased access to space, to benefit humankind? Access to low-Earth orbit, and eventually human exploration of space, is a portal to achieve many impactful outcomes. The numbers and completion rate of microgravity experiments conducted by scientists will be greatly increased as a range of offerings in suborbital flights provide more opportunities to advance critical research in health, agriculture, energy, and more. Lunar, planetary, and even asteroid exploration may lead to discoveries of new materials — busting the limitations now imposed on capabilities for energy, transportation, and infrastructure or creating new sensors and devices that enhance safety on Earth. Space tourism —one can hope — has the power to potentially create an awareness of our oneness that may lead to social change.

#### Commercial space innovation stops extinction

Charles Beames 18, Chairman of the SmallSat Alliance, Executive Chairman of York Space Systems, former Principal Director of Space and Intelligence in the Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics (OUSD(AT&L)), Col. (ret.) in the USAF where he served 23 years in space & intelligence leadership positions around the world, 8/8/18, “Op-ed | SmallSat Alliance is on a path toward a new space horizon,” <https://spacenews.com/op-ed-smallsat-alliance-is-on-a-path-toward-a-new-space-horizon/>

We find ourselves still at the dawn of a new space century, mindful of the victories and setbacks of our past, eager to pass the torch to the next generation of space visionaries, scientists, engineers, and enthusiasts. We look to the future not just to see how much bigger, faster, or higher we can reach, but also how the United States, and specifically the U.S. space community, can again inspire the nations of the world to align with us, as it did in the 20th century. The SmallSat Alliance is an alliance of companies developing, producing, and operating in all segments of the ‘next generation’ space economy; championing renewed U.S. leadership in the burgeoning commercial space economy, and advocating for the transformation of government-led space capabilities. We are experienced space professionals who have chosen to join with others leveraging our decades of hard-won experience, to develop smarter ways to explore space in the 21st century. A wonderful outgrowth of the legacy space program is the commercial, entrepreneurial, and job-creating commercial space business that it bequeathed. These next-generation enterprises range from multi-million-dollar startups providing rideshare opportunities or components for small satellites to multi-billion-dollar space data-analytic platforms reinventing urban car service and agricultural production. The early returns of this economic revolution are already on our doorstep: space data capabilities are exponentially growing elements of the 21st century world economy. Beginning with the dreams and funding by successful tech entrepreneurs, enormous venture investments are already delivering wondrous benefits to the world. Commercial Space – Profit and Non-Profit There are really two major categories in the commercial sector, the profit driven and the non-profit. The classic for-profit companies include not only those designing, building, launching, and operating satellites but also the tech sector that is turning that raw space data into gold through machine-learning analytics. Since for-profit companies are no longer dependent upon the revenues generated by the Cold War space race culture of a bygone era, this new generation of space companies is able to more efficiently capitalize on Moore’s Law, the nonstop exponential growth in chip density, and the associated networking technology co-evolving with it. This new generation is building profitable businesses helping to clean up our oceans of garbage and debris with satellite surveillance, reconnoitering to assist in enforcing laws that protect our oceans from illegal, unregulated, unlicensed fishing, something that is rapidly depleting the world’s most valuable and essential lifeforms. It’s leading in the innovative use of low-cost satellite constellations to produce ubiquitous remote-sensing data, enabling small business owners to be more profitable and less wasteful. For example, precise timing signals from space are already optimizing transportation of people, goods, and services, with even further gains anticipated with the introduction of artificial intelligence to assist drivers, perhaps even someday replacing them entirely. The non-profit sector is the other side of commercial space, concerned more for the general welfare of society, but every bit as integral to this new space enterprise. Much like every century before it in human history, ours is not without its unique challenges, some of which have been a consequence of the last, and all of which the space data domain can be leveraged to help solve. Examples are endless, but one challenge that this new space community is uniquely well-adapted for is to further inform worldwide resource allocation for the 21st century and beyond. These two primary resources are sustainable water and the materials needed for adequate housing for an ever-increasing human population. As cities and urbanization continue to expand, governmental planning challenges such as transportation design optimization for goods and services are only the beginning. Additionally, through using inexpensive remote sensing technologies, some members are designing space data analytics to mitigate human suffering from plagues, contain outbreaks, and combating illegal poaching. Some are connecting with other non-profits to curtail human trafficking for the sex trade or forced labor for migrant debt repayment. Still others are helping non-governmental organizations in their work to expose the use of children as soldiers. Addressing these challenges has little to do with resuscitating dreams conceived by long deceased science-fiction writers and much more to do with turning “swords back into plowshares” to solve real threats to humanity. Other non-profit initiatives include pursuing an even more foundational understanding of who we are and how to be the best custodians of our environment. Much as exploring and monitoring the world’s oceans has advanced civilization through a better understanding of human life and the planet, so too does exploring and monitoring from space. Low Earth orbit (LEO) provides a unique vantage point to look back on the planet and understand what is happening, anticipate what might happen and prepare for the future. In addition to better understanding Earth, responsible and rapid exploitation of the low Earth orbit domain will enhance the understanding of the solar system and the rest of the universe. Small satellites already offer low-cost platforms to study and explore what lies beyond the Earth. Other members are pioneering the use of zero-carbon, hydrogen-based reusable propulsion systems to ensure we don’t worsen our atmosphere using kerosene-fueled rockets for the coming tsunami of satellite launches. Finally, a mission ensuring the general welfare and planet survival for the next thousand years is finally confronting the existential threat that asteroids and comets pose to humanity. These extra-terrestrial, deep-space threats are passing dangerously close to our planet, and today we have no solar map of them and no defense.

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#### Death impacts are necrophilia that results in extinction---vote NEG to reject death impacts---that’s a gateway issue

Dr. Erich Seligmann Fromm 64 (Dr. Erich Seligmann Fromm was a German social psychologist, psychoanalyst, sociologist, humanistic philosopher, and democratic socialist, 1964, accessed 12/28/21, “Creators and Destroyers”)AGabay

\*language modification is denotated with brackets

People are aware of the possibility of nuclear war; they are aware of the destruction such a war could bring with it--and yet they seemingly make no effort to avoid it. Most of us are puzzled by this behavior because we start out from the premise that people love life and fear death. Perhaps we should be less puzzled if we questioned this premise. Maybe there are many people who are indifferent to life and many others who do not love life but who do love death. There is an orientation which we may call love of life (biophilia); it is the normal orientation among healthy persons. But there is also to be found in others a deep attraction to death which, following Unamuno's classic speech made at the University of Salamanca (1938), I call **necrophilia**. It is the attitude which a Franco general, Millán Astray, expressed in the slogan "Long live death, thus provoking Unamuno’s protest against this "necrophilous and senseless cry." Who is a necrophilous person? He is one who is **attracted** to and fascinated by all that is not alive, to all that is **dead**; to corpses, to decay, to feces, to dirt. Necrophiles are those people who love to talk about sickness, burials, **death**. They come to life precisely when they can talk about death. A clear example of the pure necrophilous type was Hitler. He was fascinated by destruction, and the smell of death was sweet to [them] him. While in the years of success it may have appeared that he wanted only to destroy those whom he considered his enemies, the days of the Götterdämmerung at the end showed that his deepest satisfaction lay in witnessing total and absolute destruction: that of the German people, of those around [them] him, and of [themselves] himself. The necrophilous dwell in the past, never in the future. Their feelings are essentially sentimental; that is, they nurse the memory of feelings which they had yesterday--or believe that they had. They are cold, distant, devotees of "law and order." Their values are precisely the reverse of the values we connect with normal life; not life, but death **excites** and satisfies them. If one wants to understand the influence of [persons] men like Hitler and Stalin, it lies precisely in their unlimited capacity and willingness to kill. For this they' were loved by the necrophiles. Of the rest, many were afraid of them and so preferred to admire, rather than to be aware of, their fear. Many others did not sense the necrophilous quality of these leaders and saw in them the builders, saviors, good fathers. If the necrophilous leaders had not pretended that they were builders and protectors, the number of people attracted to them would hardly have been sufficient to help them seize power, and the number of those repelled by them would probably soon have led to their downfall. While life is characterized by growth in a structured, functional manner, the necrophilous principle is all that which does not grow, that which is mechanical. The necrophilous person is driven by the **desire** to transform the organic into the inorganic, to approach life mechanically, as if all living persons were things. All living processes, feelings, and thoughts are transformed into things. Memory, rather than experience--having, rather than being--are what counts. The necrophilous person can relate to an object--a flower or a person--only if he possesses it; hence, a threat to his possession is a threat to [themselves] himself; if he loses possession he loses contact with the world. That is why we find the paradoxical reaction that he would rather lose life than possession, even though, by losing life, he who possesses has ceased to exist. He loves control, and in the act of controlling he kills life. He is deeply afraid of life, because it is disorderly and uncontrollable by its very nature. The woman who wrongly claims to be the mother of the child in the story of Solomon's judgment is typical of this tendency; she would rather have a properly divided dead child than lose a living one. To the necrophilous person justice means correct division, and they are willing to kill or die for the sake of what they call, justice. "Law and order" for them are idols, and everything that threatens law and order is felt as a satanic attack against their supreme values. The necrophilous person is attracted to darkness and night. In mythology and poetry (as well as in dreams) he is attracted to caves, or to the depth of the ocean, or depicted as being blind. (The trolls in Ibsen's Peer Gynt are a good example.) All that is away from or directed against life attracts [them] him. He wants to return to the darkness {23} of the womb, to the past of inorganic or subhuman existence. He is essentially oriented to the past, not to the future, which he hates and fears. Related to this is his craving for certainty. But life is never certain, never predictable, never controllable; in order to make life controllable, it must be transformed into **death**; death, indeed, is the only thing about life that is certain to [them] him. The necrophilous person can often be recognized by his looks and his gestures. He is cold, his skin looks dead, and often he has an expression on his face as though he were smelling a bad odor. (This expression could be clearly seen in Hitler's face.) He is orderly and obsessive. This aspect of the necrophilous person has been demonstrated to the world in the figure of Eichmann. Eichmann was fascinated by order and death. His supreme values were obedience and the proper functioning of the organization. He transported Jews as he would have transported coal. That they were human beings was hardly within the field of his vision; hence, even the problem of his having hated or not hated his victims is irrelevant. He was the perfect bureaucrat who had transformed all life into the administration of things. But examples of the necrophilous character are by no means to be found only among the inquisitors, the Hitlers and the Eichmanns. There are any number of individuals who do not have the opportunity and the power to kill, vet whose necrophilia expresses itself in other and (superficially seen) more harmless ways. An example is the mother who will always be interested in her child's sickness, in his failures, in dark prognoses for the future; at the same time she will not be impressed by a favorable change nor respond to her child's joy, nor will she notice anything new that is growing within [them] him. We might find that her dreams deal with sickness, death, corpses, blood. She does not harm the child in any obvious way, yet she may slowly strangle the child's joy of life, his faith--in growth, and eventually infect [them] him with her own necrophilous orientation. My description may have given the impression that all the features mentioned here are necessarily found in the necrophilous person. It is true that such divergent features as the wish to kill, the worship of force, the attraction to death and dirt, sadism, the wish to transform the organic into the inorganic through "order" are all part of the same basic orientation. Yet so far as individuals are concerned, there are considerable differences with respect to the strength of these respective trends. Any one of the features mentioned here may be more pronounced in one person than in another. Furthermore, the degree to which a person is necrophilous in comparison with his biophilous aspects and the degree to which a person is aware of necrophilous tendencies and rationalizes them vary considerably from person to person. Yet the concept of the necrophilous type is by no means an abstraction or summary of various disparate behavior trends. Necrophilia constitutes a **fundamental orientation**; it is the one answer to life that is in complete opposition to life; it is the most morbid and the most dangerous among the orientations to life of which [person] man is capable. It is true perversion; while living, not life but death is loved--not growth, but destruction. The necrophilous person, if he dares to be aware of what he feels, expresses the motto of his life when he says: "Long live death!" The opposite of the necrophilous orientation is the biophilous one; its essence is love of life in contrast to love of death. Like necrophilia, biophilia is not constituted by a single trait but represents a total orientation, an entire way of being. It is manifested in a person's bodily processes, in his emotions, in his thoughts, in his gestures; the biophilous orientation expresses itself in the whole [person] man. The person who fully loves life is attracted by the process of life in all spheres. He prefers to construct, rather than to retain. He is capable of wondering, and he prefers to see something new to the security of finding the old confirmed. He loves the adventure of living more than he does certainty. His approach to life is functional rather than mechanical. He sees the whole rather than only the parts, structures rather than summations. He wants to mold and to influence by love, by reason, by his example--not by force, by cutting things apart, by the bureaucratic manner of administering people as if they were things. He enjoys life and all its manifestations, rather than mere excitement. Biophilic ethics has its own principle of good and evil. Good is all that serves life; evil is all that serves death. Good is reverence for life (this is the main thesis of Albert Schweitzer, one of the great representatives of the love of life--both in his writings and in his person), and all that enhances life. Evil is all that stifles life, narrows it down, {24} cuts it into pieces. Thus it is from the standpoint of life-ethics that the Bible mentions as the central sin of the Hebrews: "Because thou didst not serve thy Lord with joy and gladness of heart in the abundance of all things." The conscience of the biophilous person is not one of forcing oneself to refrain from evil and to do good. It is not the superego described by .Freud, a strict taskmaster employing sadism against oneself for the sake of virtue. The biophilous conscience is motivated by its attraction to life and joy; the moral effort consists in strengthening the life-loving side in oneself. For this reasons the biophile does not dwell in remorse and guilt, which are, after all, only aspects of self-loathing and sadness. He turns quickly to life and attempts to do good. Spinoza's Ethics is a striking example of biophilic morality. "Pleasure," he says, "in itself is not bad but good; contrariwise, pain in itself is bad." And in the same spirit: "A free [**person**] man thinks of death least of all things; and his wisdom is a **meditation** not of death but of **life**." Love of life underlies the various versions of humanistic philosophy. In various conceptual forms these philosophies are in the same vein as Spinoza's; they express the principle that the same man loves life; that [peoples] man's aim in life is to be attracted by all that is alive and to separate [themselves] himself from all that is dead and mechanical. The dichotomy of biophilia-necrophilia is the same as Freud's life-and-death instinct. I believe, as Freud did, that this is the most fundamental polarity that exists. However, there is one important difference. Freud assumes that the striving toward death and toward life are two biologically given tendencies inherent in all living substance that their respective strengths are relatively constant, and that there is only one alternative within the operation of the death instinct--namely, that it can be directed against the outside world or against oneself. In contrast to these assumptions I believe that necrophilia is not a normal biological tendency, but a pathological phenomenon--in fact, the most malignant pathology that exists in mail. What are we, the people of the United States today, with respect to necrophilia and biophilia? Undoubtedly our spiritual tradition is one of love of life. And not only this. Was there ever a culture with more love of "fun" and excitement, or with greater opportunities for the majority to enjoy fun and excitement? But even if this is so, fun and excitement is not the same as joy and love of life; perhaps underneath there is indifference to life, or attraction to death? To answer this question we must consider the nature of our bureaucratized, industrial, mass civilization. Our approach to life becomes increasingly mechanical. The aim of social efforts is to produce things, and, in the process of idolatry of things we transform ourselves into commodities. The question here is not whether they are treated nicely and are well fed (things, too, can be treated nicely); the question is whether people are things or living beings. People love mechanical gadgets more than living beings. The approach to man is intellectual-abstract. One is **interested** in people as objects, in their common properties, in the statistical rules of mass behavior, not in living individuals. All this goes together with the increasing role of bureaucratic methods. In giant centers of production, giant cities, giant countries, [people] men are administered as if they were things; [people] men and their administrators are transformed into things, and they obey the law of things. In a bureaucratically organized and centralized industrialism, [people’s] men's tastes are manipulated so that they consume maximally and in predictable and profitable directions. Their intelligence and character become standardized by the ever-increasing use of tests, which select the mediocre and unadventurous over the original and daring. Indeed, the bureaucratic-industrial civilization that has been victorious in Europe and North America has created a new type of man. He has been described as the "organization man" and as homo consumens. He is in addition the homo mechanicus. By this I mean a "gadget man," deeply attracted to all that is mechanical and inclined against all that is alive. It is, of course, true that man's biological and physiological equipment provides him with such strong sexual impulses that even the homo mechanicus still has sexual desires and looks for women. But there is no doubt that the gadget man's interest in women is diminishing. A New Yorker cartoon pointed to this very amusingly: a sales girl trying to sell a certain brand of perfume to a young female customer recommends it by remarking, "It smells like a new sports car." Indeed, any observer of [people’s] men's behavior today will confirm that this cartoon is more than a clever joke. There are apparently a great number of [people] men who are more interested in sports-cars, television and radio sets, space travel, and any number of gadgets than they are in women, love, nature, food; who are more stimulated by the manipulation of non-organic, mechanical things than by life. Their attitude toward a woman is like that toward a car: you push the button and watch it race. It is not even too farfetched to assume that **homo mechanicus** has more pride in and is more fascinated by, devices that can **kill millions** of people across a distance of several thousands of miles within minutes than he is frightened and depressed by the possibility of such mass destruction. Homo mechanicus still likes sex {25} and drink. But all these pleasures are sought for in the frame of reference of the mechanical and the unalive. He expects that there must be a button which, if pushed, brings happiness, love, pleasure. (Many go to a psychoanalyst under the illusion that he can teach them to find the button.) The homo mechanicus becomes more and more interested in the manipulation of machines, rather than in the participation in and response to life. Hence he becomes indifferent to life, fascinated by the mechanical, and eventually attracted by death and total destruction. This affinity between the love of destruction and the love of the mechanical may well have been expressed for the first time in Marinetti's Futurist Manifesto (1909). "A roaring motor-car, which looks as though running on a shrapnel is more beautiful than the Victory of Samothrace. … We wish to glorify war--the only health-giver of the world-- militarism, patriotism, the destructive arm of the Anarchist, the beautiful Ideas that kill the contempt for woman." Briefly then, intellectualization, quantification, abstractification, bureaucratization, and reification--the very characteristics of modern industrial society--when applied to people rather than to things are not the principles of life but those of mechanics. People living in such a system must necessarily become indifferent to life, even **attracted** to **death**. They are not aware of this. They take the thrills of excitement for the joys of life and live under the illusion that they are very much alive when they only have many things to own and to use. The lack of protest against nuclear war and the discussion of our "atomologists" of the balance sheet of total or half-total destruction show how far we have already gone into the "**valley of the shadow of death.**"1 To speak of the necrophilous quality of our industrial civilization does not imply that industrial production as such is necessarily contrary to the principles of life. The question is whether the principles of social organization and of life are subordinated to those of mechanization, or whether the principles of life are the dominant ones. Obviously, the industrialized world has not found thus far an answer, to the question posed here: How is it possible to create a humanist industrialism as against the bureaucratic mass industrialism that rules our lives today? The danger of nuclear war is so grave that man may arrive at a new barbarism before he has even a chance to find the road to a humanist industrialism. Yet not all hope is lost; hence we might ask ourselves whether the hypothesis developed here could in any way contribute to finding peaceful solutions. I believe it might be useful in several ways. First of all, an awareness of our pathological situation, while not yet a cure, is nevertheless a **first step**. If more people **became aware** of the difference between love of life and love of death, if they became aware that they themselves are already far gone in the direction of indifference or of necrophilia, this shock alone could produce new and healthy reactions.

## Case

### Advantage 1 [Colonialism]

#### No capitalism offense for them–it’ll exist in alternative sectors beyond space–they have to materialize how they uniquely solve all of capitalism to access this impact – the environmental destruction from appropriation is no different than me littering – make them prove a link differential

#### The 1AC explicitly rejects capitalism in favor of assertions about unsustainability –

#### Capitalism is good – three warrants --

#### 1---Climate---Growth’s sustainable---exponential innovation and intangible capital solve the environment.

Zenghelis 21, MSc, Senior Visiting Fellow at the London School of Economics. Previously he was Head of Policy at the Grantham Research Institute at the LSE. Before that, he headed the Stern Review Team at the Office of Climate Change, London, and was a lead author on the Stern Review on the Economics of Climate Change. (Dimitri, 3-19-2021, "Sustainability Is Not Only Compatible With Growth, It Requires It – But Only With Targeted Innovation", *Forbes*, <https://www.forbes.com/sites/dimitrizenghelis/2021/03/19/can-we-be-green-and-grow/?sh=1d80dc304ce0>)

The notion that ‘green’ and growth are traded off is intuitively appealing, but it relies on the assumption that economic growth equates to growth in material use (such as fuels, minerals, ecosystem services and capital equipment) and pollution. In fact, efficiency and productivity improvements can allow us to get more out of the resources we have by decoupling GDP from materials. It is true, the world has never before managed this, but the fact is we have never really tried. Sustainability is in our gift Where a minimal public and private effort has been made to invest in new technologies, for example in renewable energy and electric vehicles, great progress has been made towards decarbonising the electricity and transport sectors. This relied heavily on taxpayer funded research and deployment policies to kick start innovation. Moreover, once learning, experience and economies of scale in production and discovery kicked in, these innovative new technologies turned out to be cheaper, more efficient and more productive than the incumbents they replaced. Exponential growth is not only possible, it is exactly what you’d expect in a world where you did not increase your resource or greenhouse gas footprint. You’d learn to use resources smarter and get more out of them. Investing in science, creativity and innovation can accelerate our ability to use fewer resources. In this way, increasing returns to ideas overcome diminishing returns to factors, such as labour and physical capital. This then generates more resources for further investment. Unlike material resources, ideas are weightless. Knowledge begets knowledge and does not deplete when used. Ideas can be weightless as well as priceless The green transition can serve to accelerate this trend provided we steer innovation in a way that enhances prosperity. The World Bank estimates that intangible capital—ideas, processes, software, databases, new media libraries, creative copy-write and online services—now makes up between 60% and 80% of total wealth in most developed countries.

#### 2---Space Col---Cap creates the innovation to get off the rock

Thiessen ‘20 – writes a twice-weekly column for The Post on foreign and domestic policy. He is a fellow at the American Enterprise Institute, and the former chief speechwriter for President George W. Bush. (Marc A., "SpaceX’s success is one small step for man, one giant leap for capitalism," Washington Post, 6-1-2020, https://www.washingtonpost.com/opinions/2020/06/01/spacexs-success-is-one-small-step-man-one-giant-leap-capitalism/, Accessed 6-27-2021, LASA-SC)

It was one small step for man, one giant leap for capitalism. Only three countries have ever launched human beings into orbit. This past weekend, SpaceX became the first private company ever to do so, when it sent its Crew Dragon capsule into space aboard its Falcon 9 rocket and docked with the International Space Station. This was accomplished by a company Elon Musk started in 2002 in a California strip mall warehouse with just a dozen employees and a mariachi band. At a time when our nation is debating the merits of socialism, SpaceX has given us an incredible testament to the power of American free enterprise. While the left is advocating unprecedented government intervention in almost every sector of the U.S. economy, from health care to energy, today Americans are celebrating the successful privatization of space travel. If you want to see the difference between what government and private enterprise can do, consider: It took a private company to give us the first space vehicle with touch-screen controls instead of antiquated knobs and buttons. It took a private company to give us a capsule that can fly entirely autonomously from launch to landing — including docking — without any participation by its human crew. It also took a private company to invent a reusable rocket that can not only take off but land as well. When the Apollo 11 crew reached the moon on July 20, 1969, Neil Armstrong declared “the Eagle has landed.” On Saturday, SpaceX was able to declare that the Falcon had landed when its rocket settled down on a barge in the Atlantic Ocean — ready to be used again. That last development will save the taxpayers incredible amounts of money. The cost to NASA for launching a man into space on the space shuttle orbiter was $170 million per seat, compared with just $60 million to $67 million on the Dragon capsule. The cost for the space shuttle to send a kilogram of cargo into to space was $54,500; with the Falcon rocket, the cost is just $2,720 — a decrease of 95 percent. And while the space shuttle cost $27.4 billion to develop, the Crew Dragon was designed and built for just $1.7 billion — making it the lowest-cost spacecraft developed in six decades. SpaceX did it in six years — far faster than the time it took to develop the space shuttle. The private sector does it better, cheaper, faster and more efficiently than government. Why? Competition. Today, SpaceX has to compete with a constellation of private companies — including legacy aerospace firms such as Orbital ATK and United Launch Alliance and innovative start-ups such as Blue Origin (which is designing a Mars lander and whose owner, Jeff Bezos, also owns The Post) and Virgin Orbit (which is developing rockets than can launch satellites into space from the underside of a 747, avoiding the kinds of weather that delayed the Dragon launch). In the race to put the first privately launched man into orbit, upstart SpaceX had to beat aerospace behemoth Boeing and its Starliner capsule to the punch. It did so — for more than $1 billion less than its competitor. That spirit of competition and innovation will revolutionize space travel in the years ahead. Indeed, Musk has his sights set far beyond Earth orbit. Already, SpaceX is working on a much larger version of the Falcon 9 reusable rocket called Super Heavy that will carry a deep-space capsule named Starship capable of carrying up to 100 people to the moon and eventually to Mars. Musk’s goal — the reason he founded SpaceX — is to colonize Mars and make humanity a multiplanetary species. He has set a goal of founding a million-person city on Mars by 2050 complete with iron foundries and pizza joints. Can it be done? Who knows. But this much is certain: Private-sector innovation is opening the door to a new era of space exploration. Wouldn’t it be ironic if, just as capitalism is allowing us to explore the farthest reaches of our solar system, Americans decided to embrace socialism back here on Earth?

#### Otherwise inevitable extinction.

Zarkadakis ’19 [George; December 26; Ph.D. in Artificial Intelligence; George Zardakis, “Abandoning the metropolis: space colonisation as the new imperative,” <https://georgezarkadakis.com/2019/12/26/abandoning-the-metropolis-space-colonisation-as-the-new-imperative/>]

Space colonization is not only the subject of fiction but of serious science too. The late physicist Stephen Hawking argued that unless colonies were established in space the human race would become extinct. There are several natural phenomena beyond our control that could spell our obliteration. Over a long enough period of time our planet is vulnerable to catastrophic meteorite strikes, or getting exposed to the deadly radiation of a nearby supernova explosion. As our Sun burns its fuel it will start to expand and, in a few million years, will scorch Earth. We can also self-destruct by waging nuclear war, or by tilting our planet’s climate towards a runaway greenhouse effect. Space colonization is therefore the ultimate insurance policy of long-term human survival[4]. Physics and Biology: how to solve the challenges of interstellar travel But colonizing space is hard. Three are the main problem categories for humans surviving away from Earth over an indefinite period of time. The first, and probably easiest to solve, is finding a place suitable for colonization. Our solar system provides several possible habitats, the most obvious ones being of course the Moon and Mars. The Jovian moons could also be colonization targets. The Artemis Project[5], a private venture to establish a permanent, self-sustainable human base on the Moon, has proposed the Jovian moon Europa as an alternative future habitat, given the possibility of a hot interior and a liquid ocean of water under the icy surface, both of which could provide for a sustainable human base. Colonizing the Solar System could be a stepping-stone for venturing to worlds beyond, of which there are aplenty. In 2009 NASA launched the Kepler space telescope to discover Earth-size planets orbiting other stars in habitable zones. More than 1,300 planets have been discovered so far, in about 440 star systems; the nearest planet may be “only” 12 light years away. Based on Kepler’s findings scientists estimate that there could be as many as 11 billion rocky, Earth-like planets orbiting habitable zones of Sun-like stars in our Galaxy. The possibilities for expanding humanity’s reach in the cosmos are truly astronomical. The second problem category is how to get to these other worlds: space travel is a hugely challenging technological problem. After more than six decades of space engineering we are still dependent of heavy rockets that burn chemical fuel to get us out of the Earth’s gravity. Perhaps the greatest innovation so far is the reusable rockets pioneered by Elon Musk’s Falcon 9 and Jeff Bezos’s Charon. Having reusable rockets significantly lowers the cost of space flight. According to Elon Musk it costs $60 million to make the Falcon 9, and $200,000 to refuel it, so theoretically by reusing a rocket multiple times the cost of each flight lowers every time it flies. There are of course additional costs for refurbishment after each flight that must be factored in, but reusing rockets looks like the most practical way to advance space technology today. Alternatively, we could have a space elevator carrying people and equipment on low orbit, an idea envisioned by the pioneering Russian scientist Konstantin Tsiolkovsky back in 1895. Researchers in Japan’s Shizuoka University are presently advancing the concept by using two mini satellites to test elevator motion in space. Moreover, the Obayashi Corporation, which will build Japan’s largest tower, has put together a space elevator proposal that will take people from Earth to an orbiting space station. However, the solution requires 60,000 miles of cable made of carbon nanotubes or an as-yet undeveloped material. Owing to developments in quantum computing in the next ten years, we may be able to exponentially advance the production of materials for constructing space elevators, as well as for developing new rocket fuels; and thus dramatically reduce the cost of space flight. By harnessing near-infinite computing power and accessing calculations at quantum level physicists may be able to unlock the mysteries of dark matter and dark energy, and probe deeper into the fundamental structure the universe.

#### 3---War---crash causes it

Liu ’18 [Qian; November 2; Economist, Managing Director at Greater China, citing the economist Thomas Piketty and political scientist Samuel Huntington; Project Syndicate, “From economic crisis to World War III,” p. 1-2; RP]

The next economic crisis is closer than you think. But what you should really worry about is what comes after: in the current social, political, and technological landscape, a prolonged economic crisis, combined with rising income inequality, could well escalate into a major global military conflict. The 2008-09 global financial crisis almost bankrupted governments and caused systemic collapse. Policymakers managed to pull the global economy back from the brink, using massive monetary stimulus, including quantitative easing and near-zero (or even negative) interest rates. But monetary stimulus is like an adrenaline shot to jump-start an arrested heart; it can revive the patient, but it does nothing to cure the disease. Treating a sick economy requires structural reforms, which can cover everything from financial and labour markets to tax systems, fertility patterns, and education policies. Policymakers have utterly failed to pursue such reforms, despite promising to do so. Instead, they have remained preoccupied with politics. From Italy to Germany, forming and sustaining governments now seems to take more time than actual governing. Greece, for example, has relied on money from international creditors to keep its head (barely) above water, rather than genuinely reforming its pension system or improving its business environment. The lack of structural reform has meant that the unprecedented excess liquidity that central banks injected into their economies was not allocated to its most efficient uses. Instead, it raised global asset prices to levels even higher than those prevailing before 2008. In the United States, housing prices are now 8% higher than they were at the peak of the property bubble in 2006, according to the property website Zillow. The price-to-earnings (CAPE) ratio, which measures whether stock-market prices are within a reasonable range, is now higher than it was both in 2008 and at the start of the Great Depression in 1929. As monetary tightening reveals the vulnerabilities in the real economy, the collapse of asset-price bubbles will trigger another economic crisis – one that could be even more severe than the last, because we have built up a tolerance to our strongest macroeconomic medications. A decade of regular adrenaline shots, in the form of ultra-low interest rates and unconventional monetary policies, has severely depleted their power to stabilise and stimulate the economy. If history is any guide, the consequences of this mistake could extend far beyond the economy. According to Harvard’s Benjamin Friedman, prolonged periods of economic distress have been characterised also by public antipathy toward minority groups or foreign countries – attitudes that can help to fuel unrest, terrorism, or even war. For example, during the Great Depression, US President Herbert Hoover signed the 1930 Smoot-Hawley Tariff Act, intended to protect American workers and farmers from foreign competition. In the subsequent five years, global trade shrank by two-thirds. Within a decade, World War II had begun. To be sure, WWII, like World War I, was caused by a multitude of factors; there is no standard path to war. But there is reason to believe that high levels of inequality can play a significant role in stoking conflict. According to research by the economist Thomas Piketty, a spike in income inequality is often followed by a great crisis. Income inequality then declines for a while, before rising again, until a new peak – and a new disaster. Though causality has yet to be proven, given the limited number of data points, this correlation should not be taken lightly, especially with wealth and income inequality at historically high levels. This is all the more worrying in view of the numerous other factors stoking social unrest and diplomatic tension, including technological disruption, a record-breaking migration crisis, anxiety over globalisation, political polarisation, and rising nationalism. All are symptoms of failed policies that could turn out to be trigger points for a future crisis. Voters have good reason to be frustrated, but the emotionally appealing populists to whom they are increasingly giving their support are offering ill-advised solutions that will only make matters worse. For example, despite the world’s unprecedented interconnectedness, multilateralism is increasingly being eschewed, as countries – most notably, Donald J. Trump’s US – pursue unilateral, isolationist policies. Meanwhile, proxy wars are raging in Syria and Yemen. Against this background, we must take seriously the possibility that the next economic crisis could lead to a large-scale military confrontation. By the logic of the political scientist Samuel Huntington, considering such a scenario could help us avoid it because it would force us to take action. In this case, the key will be for policymakers to pursue the structural reforms that they have long promised while replacing finger-pointing and antagonism with a sensible and respectful global dialogue. The alternative may well be global conflagration.

#### Several alt causes to ozone

#### 1] Copper

**Berkeley 1/13** (Robert Rhew and Berkeley geo chemists, [UC Berkeley professor of geography and of environmental science, policy and management], 1-13-2022, “Copper-based chemicals may be contributing to ozone depletion: Some ozone-destroying chemicals are unaccounted for. Are copper-based fungicides producing them?“, ScienceDaily, accessed: 1-15-2022, https://www.sciencedaily.com/releases/2022/01/220113151441.htm) ajs

In a paper appearing this week in the journal Nature Communications, UC Berkeley geochemists show that copper in soil and seawater acts as a catalyst to turn organic matter into both methyl bromide and methyl chloride, two potent halocarbon compounds that destroy ozone. Sunlight worsens the situation, boosting production of these methyl halides by a factor of 10. The findings answer, at least in part, a long-standing mystery about the origin of much of the methyl bromide and methyl chloride in the stratosphere. Since the worldwide ban on chlorofluorocarbon (CFC) refrigerants and brominated halons used in fire extinguishers starting in 1989, these methyl halides have become the new dominant sources of ozone-depleting bromine and chlorine in the stratosphere. As the long-lived CFCs and halons slowly disappear from the atmosphere, the role of methyl halides increases. "If we don't know where methyl bromide and methyl chloride are coming from, then how can we make sure that those compounds are reduced along with CFCs?" said the paper's senior author, Robert Rhew, UC Berkeley professor of geography and of environmental science, policy and management. "By 2050, we should be back to relatively normal ozone, but things like the continued emissions of methyl bromide and methyl chloride are road bumps in the road to recovery. Copper usage in the environment is projected to increase rapidly in the next few years, and this should be considered when predicting future halogen load and ozone recovery."

#### 2] Illegal CFC sources

**Mcglaun 21** (Shane Mcglaun, [Slash Gear Writer], 5-19-2021, “MIT study suggests illegal production of CFCs has continued“, SlashGear, accessed: 1-15-2022, https://www.slashgear.com/mit-study-suggests-illegal-production-of-cfcs-has-continued-19673398/) ajs

Researchers at MIT have discovered that ozone-depleting chlorofluorocarbons known as CFCs stay in the atmosphere for less time than previously estimated. CFCs were phased out globally in 2010, and the research suggests they should be in the atmosphere in much lower concentrations than recent measurements suggest. The study suggests that new and illegal production of CFCs has likely occurred in recent years. The study specifically points out [new emissions](https://news.mit.edu/2021/cfc-atmosphere-ozone-0518) of CFC-11, CFC-12, and CFC-113 that would represent a violation of the Montréal Protocol. That protocol was designed to phase out the production and consumption of CFCs along with other ozone-damaging chemicals. The study estimates that new global CFC-11 emissions is higher than previous studies reported. MIT’s study is also the first to quantify new global emissions of CFC-12 and CFC-113. Lead study author Megan Lickley says the team found total emissions coming from new production is around 20 gigagrams a year for each of those molecules. The study also identified new emissions of CFC-12 and CFC-113, which Lickley says were previously overlooked. In the past, CFCs were used commonly in manufacturing refrigerants, aerosol sprays, chemical solvents, and building insulation. When they are emitted into the atmosphere, the chemicals can stay in the stratosphere interacting with ultraviolet light and releasing chlorine atoms that erode the protective ozone layer surrounding the earth. Today, most CFCs are emitted by “banks,” old refrigerators, air conditioners, and insulation manufactured before the ban. For the study, the researchers calculated the amount of CFCs remaining in banks today by developing a model analyzing industry production of CFCs over time and how quickly various types of equipment release CFCs. That value was then incorporated in the current recommended values for the lifetime of the chemicals to calculate concentrations of bank-derived CFCs that could be expected in the atmosphere over time. The team says the calculated lifetimes for CFC-11, 12, and 113 are 49 years, 85 years, and eight years respectively, compared to current values of 52, 100, and 85 years respectively. The results imply emissions are likely higher than the best estimates have suggested.

#### 3] Dichloromethane

**Perkins 17** Sid Perkins 6-27-2017 "New threat to ozone layer found"<https://www.science.org/content/article/new-threat-ozone-layer-found> (Sid is a freelance science journalist based in Crossville, Tennessee. He specializes in earth sciences and paleontology but often tackles topics such as astronomy, planetary sciences, materials sciences, and engineering. Sid has a bachelor’s degree in natural science from Christian Brothers College in Memphis, Tennessee; bachelor’s and master’s degrees in aeronautical engineering from the Air Force Institute of Technology in Ohio; and a master’s degree in journalism from the University of Missouri in Columbia)//Elmer

The ozone layer—a high-altitude expanse of oxygen molecules that protects us from the sun's ultraviolet rays—has been on the mend for the past decade or so. But a newly discovered threat could delay its recovery. Industrial emissions of a chemical commonly used in solvents, paint removers, and the production of pharmaceuticals have doubled in the past few years, researchers have found, which could slow the healing of the ozone layer over Antarctica anywhere between 5 and 30 years—or even longer if levels continue to rise. The findings are "frightening" and "a big deal," says Robyn Schofield, an environmental scientist at the University of Melbourne in Australia who was not involved with the work. The chemical in question is called dichloromethane (CH2Cl2). Natural sources of this substance are small, says Ryan Hossaini, an atmospheric chemist at Lancaster University in the United Kingdom. Thus, he notes, the increase in emissions seen in recent years likely stems from human sources. Between 2000 and 2012, low-altitude concentrations of CH2Cl2 vapor rose, on average, about 8% per year, he adds. Globally, concentrations of CH2Cl2 approximately doubled between 2004 and 2014. Current CH2Cl2 emissions are about 1 million metric tons per year, Hossaini and his team estimate. Like chlorofluorocarbons (CFCs) and several other ozone-destroying chemicals you may have heard of, CH2Cl2 breaks apart when struck by sunlight. The chlorine atoms that are released then dismantle any ozone molecules they interact with. In 1987, an international agreement known as the Montreal Protocol led to a ban on the production and use of CFCs and many related compounds in industrial nations, but it ignored CH2Cl2 because researchers thought it didn't stay intact in the atmosphere long enough to rise into the stratosphere. Recent evidence now suggests, however, that the molecules can reach the lower edge of the stratosphere, which includes the ozone layer, despite its height 8 kilometers above the poles. To gauge the current and future threat to high-altitude ozone from CH2Cl2, Hossaini and his colleagues used computer simulations. In 2016, their analyses suggest, about 3% of the summer ozone loss in the Antarctic could be traced to CH2Cl2. That seems small, but in 2010 the substance was responsible for only 1.5% of the region's summer ozone loss, Hossaini says. If CH2Cl2 emissions continue to rise at the rate seen in the last decade, recovery of the ozone hole would be delayed about 30 years, the researchers estimate in Nature Communications. But if emissions of CH2Cl2 are held to current levels, healing of the ozone hole would be delayed only 5 years or so, the team finds. Simulations that don't include the effect of CH2Cl2 suggest that high-altitude ozone in the Antarctic will return to pre-1980 levels, the concentration measured before CFCs and other ozone-destroying chemicals were recognized as a problem, in 2065. The team's analyses "are quite important," says Björn-Martin Sinnhuber, an atmospheric scientist at Karlsruhe Institute of Technology in Germany. "It's clear that concentrations [of CH2Cl2] have increased quite a lot," he notes. But one critical question, he contends, is what will happen to emissions over the long term: "They've been quite variable in recent years, and it's difficult to say how they might evolve." Although the rapid rise in CH2Cl2 emissions may one day level off, it's also possible that emissions of this multipurpose chemical may accelerate even further. Hossaini and his team also assessed what would happen to high-altitude ozone if CH2Cl2 emissions rose at twice the rate seen in the past decade. The answer? Not good. Antarctic ozone wouldn't recover to pre-1980 levels until well after the year 2100, the analyses suggest. All this means that scientists now reviewing the Montreal Protocol should consider expanding the agreement to also regulate substances like CH2Cl2 that have atmospheric lifetimes of less than 6 months, Schofield says. Possibly as important, however, the team's results might also help other researchers identify which sources of CH2Cl2 are contributing most to the recent rise in emissions. That sort of information, Hossaini admits, is sadly lacking as of now.

#### No impact to ozone

**Ridley 14** (Matthew White Ridley, BA and PhD in Zoology from Oxford. “THE OZONE HOLE WAS EXAGGERATED AS A PROBLEM,” *Rational Optimist*, 9/25/14,<http://www.rationaloptimist.com/blog/the-ozone-hole-was-exaggerated-as-a-problem.aspx>) dwc 19

Serial hyperbole does the environmental movement no favours My recent Times column argued that the alleged healing of the ozone layer is exaggerated, but so was the impact of the ozone hole over Antarctica: The ozone layer is healing. Or so said the news last week. Thanks to a treaty signed in Montreal in 1989 to get rid of refrigerant chemicals called chlorofluorocarbons (CFCs), the planet’s stratospheric sunscreen has at last begun thickening again. Planetary disaster has been averted by politics. For reasons I will explain, this news deserves to be taken with a large pinch of salt. You do not have to dig far to find evidence that the ozone hole was never nearly as dangerous as some people said, that it is not necessarily healing yet and that it might not have been caused mainly by CFCs anyway. The timing of the announcement was plainly political: it came on the 25th anniversary of the treaty, and just before a big United Nations climate conference in New York, the aim of which is to push for a climate treaty modelled on the ozone one. Here’s what was actually announced last week, in the words of a Nasa scientist, Paul Newman: “From 2000 to 2013, ozone levels climbed 4 per cent in the key mid-northern latitudes.” That’s a pretty small change and it is in the wrong place. The ozone thinning that worried everybody in the 1980s was over Antarctica. Over northern latitudes, ozone concentration has been falling by about 4 per cent each March before recovering. Over Antarctica, since 1980, the ozone concentration has fallen by 40 or 50 per cent each September before the sun rebuilds it. So what’s happening to the Antarctic ozone hole? Thanks to a diligent blogger named Anthony Watts, I came across a press release also from Nasa about nine months ago, which said: “ Two new studies show that signs of recovery are not yet present, and that temperature and winds are still driving any annual changes in ozone hole size.” As recently as 2006, Nasa announced, quoting Paul Newman again, that the Antarctic ozone hole that year was “the largest ever recorded”. The following year a paper in Nature magazine from Markus Rex, a German scientist, presented new evidence that suggested CFCs may be responsible for less than 40 per cent of ozone destruction anyway. Besides, nobody knows for sure how big the ozone hole was each spring before CFCs were invented. All we know is that it varies from year to year. How much damage did the ozone hole ever threaten to do anyway? It is fascinating to go back and read what the usual hyperventilating eco-exaggerators said about ozone thinning in the 1980s. As a result of the extra ultraviolet light coming through the Antarctic ozone hole, southernmost parts of Patagonia and New Zealand see about 12 per cent more UV light than expected. This means that the weak September sunshine, though it feels much the same, has the power to cause sunburn more like that of latitudes a few hundred miles north. Hardly Armageddon. The New York Times reported “an increase in Twilight Zone-type reports of sheep and rabbits with cataracts” in southern Chile. Not to be outdone, Al Gore wrote that “hunters now report finding blind rabbits; fisherman catch blind salmon”. Zoologists briefly blamed the near extinction of many amphibian species on thin ozone. Melanoma in people was also said to be on the rise as a result. This was nonsense. Frogs were dying out because of a fungal disease spread from Africa — nothing to do with ozone. Rabbits and fish blinded by a little extra sunlight proved to be as mythical as unicorns. An eye disease in Chilean sheep was happening outside the ozone-depleted zone and was caused by an infection called pinkeye — nothing to do with UV light. And melanoma incidence in people actually levelled out during the period when the ozone got thinner.

#### Alt causes to UV floods–your evidence doesn’t make an extinction claim

Their author **Lucas et al 14** (R. M. Lucas (National Centre for Epidemiology and Population Health, The Australian National University, Canberra 2601, Australia, Telethon Kids Institute, University of Western Australia, Perth 6008, Australia), M. Norval (Biomedical Sciences, University of Edinburgh Medical School, Edinburgh EH8 9AG, Scotland, UK), R. E. Neale (QIMR Berghofer Medical Research Institute, Brisbane 4029, Australia), A. R. Young (King's College London (KCL), St John's Institute of Dermatology, London SE1 9RT, UK), F. R. de Gruijl (Department of Dermatology, Leiden University Medical Centre, P.O. Box 9600, NL-2300 RC Leiden, The Netherlands), Y. (Akita University Graduate School of Medicine, Akita-shi, Akita Prefecture, Japan, National Institute for Minamata Diseases, Minamata-sh, Kumamoto Prefecture, Japan) and J. C. van der Leun (iEcofys, Kanaalweg 16G, NL-3526 KL Utrecht, The Netherlands), “The consequences for human health of stratospheric ozone depletion in association with other environmental factors”, November 10th, 2014, https://pubs.rsc.org/en/content/articlehtml/2015/pp/c4pp90033b) DD | JH

Due to the implementation of the Montreal Protocol, which has limited, and is now probably reversing, the depletion of the stratospheric ozone layer, only modest increases in solar UV-B radiation at the surface of the Earth have occurred. For many fair-skinned populations, changing behaviour with regard to exposure to the sun over the past half century – more time in the sun, less clothing cover (more skin exposed), and preference for a tan – has probably contributed more to greater levels of exposure to UV-B radiation than ozone depletion. Exposure to UV-B radiation has both adverse and beneficial effects on human health. This report focuses on an assessment of the evidence regarding these outcomes that has been published since our previous report in 2010. The skin and eyes are the organs exposed to solar UV radiation. Excessive solar irradiation causes skin cancer, including cutaneous malignant melanoma and the non-melanoma skin cancers, basal cell carcinoma and squamous cell carcinoma, and contributes to the development of other rare skin cancers such as Merkel cell carcinoma. Although the incidence of melanoma continues to increase in many countries, in some locations, primarily those with strong sun protection programmes, incidence has stabilised or decreased over the past 5 years, particularly in younger age-groups. However, the incidence of non-melanoma skin cancers is still increasing in most locations. Exposure of the skin to the sun also induces systemic immune suppression that may have adverse effects on health, such as through the reactivation of latent viral infections, but also beneficial effects through suppression of autoimmune reactivity. Solar UV-B radiation damages the eyes, causing cataracts and pterygium. UV-B irradiation of the skin is the main source of vitamin D in many geographic locations. Vitamin D plays a critical role in the maintenance of calcium homeostasis in the body; severe deficiency causes the bone diseases, rickets in children and osteomalacia in adults. Although many studies have implicated vitamin D deficiency in a wide range of diseases, such as cancer and cardiovascular disease, more recent evidence is less compelling, with meta-analyses of supplementation trials failing to show a beneficial effect on the health outcomes that have been tested. It continues to be difficult to provide public health messages to guide safe exposure to the sun that are accurate, simple, and can be used by people with different skin types, in different locations, and for different times of the year or day. There is increasing interest in relating sun protection messages to the UV Index. Current sun protection strategies are outlined and assessed. Climatic factors affect the amount of UV radiation received by the skin and eyes, separately from the effect of ozone depletion. For example, cloud cover can decrease or increase the intensity of UV radiation at Earth's surface and warmer temperatures and changes in precipitation patterns may alter the amount of time people spend outdoors and their choice of clothing. The combination of changes in climate and UV radiation may affect the number of pathogenic microorganisms in surface waters, and could have an impact on food security through effects on plant and aquatic systems. It remains difficult to quantify these effects and their possible importance for human health.

### Advantage 2 [Debris]

#### Space mining is good–

#### First, commercial mining solves extinction from scarcity, climate, terror, war, and disease.

**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.

#### Second, Mining solves Warming – a] Key to REM’s that spur Renewables and b] Reduces Terrestrial Mining that wrecks the environment

**MacWhorter 15**, Kevin. "Sustainable mining: Incentivizing asteroid mining in the name of environmentalism." Wm. & Mary Envtl. L. & Pol'y Rev. 40 (2015): 645. (J.D. Candidate, William & Mary Law School)//Elmer

A. Rare Element Mining on Earth In the next sixty years, scientists predict that certain elements crucial to modern industry such as platinum, zinc, copper, phosphorous, lead, gold, and indium could be exhausted on Earth. 12 Many of these have no synthetic alternative, unlike chemical elements such as oil or diamonds.13 Liquid-crystal display (LCD) televisions, cellphones, and laptops are among the various consumer technologies that use precious metals.14Further, green technologies including wind turbines, solar panels, and catalytic converters require these rare elements. 15 As demand rises for both types of technologies, and as reserves of rare metals fall, prices skyrocket.16 Demand for nonrenewable resources creates conflict, and consumerism in rich countries results in harsh labor treatment for poorer countries.17 In general, the mining industry is extremely destructive to Earth’s environment.18 In fact, depending on the method employed, mining can destroy entire ecosystems by polluting water sources and contributing to deforestation.19 It is by its nature an unsustainable practice, because it involves the extraction of a finite and non-renewable resource.20 Moreover, by extracting tiny amounts of metals from relatively large quantities of ore, the mining industry contributes the largest portion of solid wastes in the world.21 The Environmental Protection Agency (EPA) describes the industry as the source of more toxic and hazardous waste than any other industrial sector [in the United States], costing billions of dollars to address the public health and environmental threats to communities. 22 Poor regulations and oxymoronic corporate definitions of sustainability, however, make it unclear as to just how much waste the industry actually produces.23 Platinum provides an excellent case study of the issue, because it is an extremely rare and expensive metal—an ore expected to exist in vast quantities in asteroids.24 Further, production of platinum has increased sharply in the past sixty years in order to keep up with growing demand for use in new technologies.25 In fact, despite their high costs, platinum group metals are so useful that [one] of [four] industrial goods on Earth require them in production. 26 Scholars do not expect demand to slow any time soon.27 Among other technologies, industries use platinum in products such as catalytic converters, jewelry production, various catalysts for chemical processing, and hydrogen fuel cells.28 While there is no consensus on how far the Earth’s reserves of platinum will take humanity, many scientists agree that platinum ore reserves will deplete in a relatively short amount of time.29 With the rate of mining at an all-time high,30 it is increasingly clear that historical patterns of mineral resources and development cannot simply be assumed to continue unaltered into the future. 31 The platinum mining industry, however, has a strong incentive to increase its rate of extraction as profits grow with the rate of demand. Without any alternative, this destructive practice will continue into the future.32 So-called platinum-group metal (PGM) ores are mined through underground or open cut techniques.33 Due to these practices, all but a very small fraction of the mined platinum ore is disposed of as solid waste.34 The environmental consequences of platinum production are thus quite significant, but like the mining industry in general, the amount of waste is typically under-reported.35 While this is due to high production levels at the moment, those levels will only increase given the estimated future demand of platinum.36 In spite of the negative consequences, mining continues unabated because it is economically important to many areas.37 The future environmental costs provide a major challenge in creating a sustainable system. Relegating at least some mining companies to near-Earth asteroids would reduce the negative effects of future mining levels on Earth. The economic benefits of mining need not be sacrificed for the sake of the environment.38

#### No sat miscalc–

#### 1] Planning Priorities

**Bowen 18** Bleddyn Bowen 2-20-2018 “The Art of Space Deterrence”<https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/> (Lecturer in International Relations at the University of Leicester)//Elmer

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.

#### 2] Military Precedent

**Zarybnisky 18**, Eric J. Celestial Deterrence: Deterring Aggression in the Global Commons of Space. Naval War College Newport United States, 2018. (Senior Materiel Leader at United States Air Force)//Elmer

PREVENTING AGGRESSION IN SPACE While deterrence and the Cold War are strongly linked in the public’s mind through the nuclear standoff between the United States and the Soviet Union, the fundamentals of deterrence date back millennia and deterrence remains relevant. Thucydides alludes to the concept of deterrence in his telling of the Peloponnesian War when he describes rivals seeking advantages, such as recruiting allies, to dissuade an adversary from starting or expanding a conflict.6F 6 Aggression in space was successfully avoided during the Cold War because both sides viewed an attack on military satellites as highly escalatory, and such an action would likely result in general nuclear war.7F 7 In today’s more nuanced world, attacking satellites, including military satellites, does not necessarily result in nuclear war. For instance, foreign countries have used highpowered lasers against American intelligence-gathering satellites8F 8 and the United States has been reluctant to respond, let alone retaliate with nuclear weapons. This shift in policy is a result of the broader use of gray zone operations, to which countries struggle to respond while limiting escalation. Beginning with the fundamentals of deterrence illuminates how it applies to prevention of aggression in space.

#### 3] Satellites are dual use–escalates conflict

Yousaf **Butt** PhD in Nuclear Physics, a research professor and scientist-in-residence at the James Martin Center for Nonproliferation Studies at the Monterey Institute for International Studies. 2008 Can space weapons protect U.S. satellites? 7-22-**2008**, https://thebulletin.org/2008/07/can-space-weapons-protect-u-s-satellites/

Throughout this debate, it’s almost taken as an article of faith that space weapons can be defensively useful. Yet, there’s little technical basis to support this belief: While certainly offensively potent, space weapons are defensively ineffective. First, let me be clear about what I mean by the term “space weapons.” In my definition, I include any weapons based in space that can attack targets either in space or on the ground or any land-, sea-, or air-based weapons that can attack satellites.1 Fragile, blind, unmanned satellites are different from armored and actively piloted tanks, ships, and airplanes because they move in predictable orbits without situational awareness of their surroundings, providing an easy target for an enemy bent on interfering or destroying them. To save on launch costs, they’re typically built as light as possible with minimal shielding. And the few evasive actions they can take greatly sap the limited onboard fuel. The most optimistic incarnation of a defensive space weapon is the so-called “bodyguard satellite,” which is designed to protect satellites from ground-based antisatellite (ASAT) weapons. The bodyguard would shadow the high-value satellite it’s protecting by being in an identical orbit, typically trailing its “boss” by a few hundred kilometers. Once cued to a threat, it could launch an interceptor to impact and destroy the incoming ASAT kill vehicle. A single bodyguard satellite system that could intercept an incoming ASAT would have a mass of about 500 to 1,500 kilograms, including the necessary housing, solar panels, batteries, station-keeping fuel, and communication and sensor subsystems. The problem is that a single bodyguard satellite would be insufficient to guard its “boss.” Even if the bodyguard successfully intercepted an incoming ASAT, the adversary could simply try again on a successive orbit–the so-called “limited magazine” problem. Of course, a satellite could possess multiple bodyguard satellites, but the launch costs alone (about $15,000 per kilogram of payload) quickly become prohibitive for multiple bodyguards weighing about 1,000 kilograms each in orbit. At some point, the cost of having many bodyguard satellites exceeds that of the satellite being protected. It then makes more sense to simply have a backup redundant satellite ready to launch rather than multiple defensive space weapons. More problematic still is the fact that the attacker can use simple countermeasures such as decoys and flares to fool the bodyguard’s interceptor. This is the same reason why ballistic missile defense also doesn’t make sense. Directed-energy weapons such as lasers may be available in the future, but they run on chemicals as the source of the laser energy, which also are subject to the limited magazine problem if the laser is in orbit. And if the laser is ground-based, its range of lethality is limited to a small fraction of the globe in the ground-station’s vicinity. Furthermore, ground-based systems must use complicated and expensive adaptive optics to compensate for the natural broadening and dimming of the laser light as it traverses the atmosphere, something that has not yet been publicly demonstrated over hundreds of kilometers for a high-power laser. Of course, the laser ground stations are hostage to conventional ground attack, and, more prosaically, cloud cover. Thus, the much feared “Space Pearl Harbor” can happen with or without space weapons, as they provide little, if any, effective defense. In fact, introducing weapons into space that are offensively potent yet defensively ineffective may actually make a “Space Pearl Harbor” more imminent. In the eyes of potential adversaries, the only distinction between defensive and offensive space weapons would be the unknowable intention behind their use. A bodyguard satellite, for instance, could easily be reconfigured to attack other satellites instead of defending against incoming ASATs.

#### Their evidence–

#### 1–Presumes a worst case scenario–alt systems like hotlines check miscalc and irrational decisions like high alert

#### 2–Our scenarios outweigh on timeframe since conflict takes a while since debris has to kill off ALL of them but just the prospects of unstable satellites are sufficient to reduce investment in things like fracking, 5G, etc

#### 3–this is a neg arg–if there is no satellites, there’s nothing like GPS or anything, then there is no nuclear war because countries won’t know where to launch the nuke–it makes war impossible

#### 4–no cyber