# 1NC

## 1

### 1NC – P

#### Their failure to specify an agent is a voting issue – makes mechanism counterplans and agent-based disads impossible – it’s a voter for fairness because the 1AR can spike out of DAs and CPs, which kills clash and nuance.

#### Vagueness is a reason to reject the team – there's no consistent explanation of what the plan text does or which laws they change. This makes neg ground impossible and justifies infinite 1AR spins out of counterplans and offense – reject the team for deterrence.

#### Object fiat is a voting issue.

## 2

### 1NC – K

#### Outer space, the Final Frontier, is the next site of conquest for the western Man. The aff’s project of removing Starlink satellites, created through space policy, is an investment in exploitative imperialism and humanism, recreating colonialism and eugenics endlessly into the future.

Trevino ‘20 [Natalie B. Trevino; The University of Western Ontario; 10-30-2020; “The Cosmos is Not Finished”; Western University Doctor of Philosophy Thesis; https://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=9976&context=etd; Accessed 4-16-2022] AK

The cosmic order of the Final Frontier frames the exploitative aspects of space exploration as morally good and individually beneficial. Capitalism is eternalized and valorized, especially during the Cold War as Western economics and forms of governance are treated by many space advocates as exemplary or representative of a hegemonic common sense. This connection between Human/Man and capitalism is repeated and reinforced in American space policy to demonstrate how space can ensure the survival of mankind through unlimited growth (Brown, 1978). For example, Brown puts forward the case that the economic benefits of space will bring with them “infinite possibilities” for imagining new social and political ways of being. This argument reappears in O’Neill’s High Frontier with a slight cosmetic change. According to O’Neill, changes to the manufacturing structure will generate more leisure time (O'Neill, 1977). Heppenheimer speculates that zero gravity recreation will be a popular pastime. (After all, how will one spend all that leisure time in space?). Like O’Neill, Heppenheimer’s speculative imagination is hardly tested as he discusses the exportation of already-existing sports and other recreational to the environment of outer space (Heppenheimer, 1977). In their credo, the Space Frontier Foundation state that they are dedicated to a brighter future of a united humanity with free enterprise by “using the unlimited energy and material resources of space” (2019). The abstract notion of humanity that they portray in these works of advocacy fail to examine or explain the working conditions of capitalism, or to understand that this “humanity” is stratified into different classes (which depends on their structural position—and their consciousness of this position—in the totality of capitalist production). On the contrary, they assume that their notion of humanity is characteristic of all peoples; yet truthfully, very few people can access to the gains of capital due to structural mechanisms. Unfortunately, the promise of the “infinite possibilities” of space is reduced to a stain way of life that indulges trivial American middle-class pastimes and ignores the exploitative economic system that makes this kind of social existence possible.

Consequently, the reproduction of socio-economic and cultural norms implies the type of person that matches this future in space. On top of these abstract conceptions of humanity, space advocates fail to fulfil their promise of envisioning a cosmic order of infinite possibilities. While this may be part of advocates’ goals of reaching a general audience to gain support for public or private space activities, their failure to imagine a real future is a consequence of their limited conception of humanity as Human/Man, as the “criterion of being human” (Wynter, 2003). Space advocates assume that their norms are either universal or almost universal, that they are the cultural and social norms of “every man.” Such assumptions derive from a sense of false objectivity and the history of genocide and epistemicide and build on social and political norms that are encouraged, valorized, and reproduced en masse. Those who do not conform to American individualist context have only themselves to blame for not fitting the standards that are repeatedly normalized and remain exclusionary. Not only are most people systematically excluded from norms and structures, individuals choose not to take part out of discomfort. In either case, the normative, Eurocentric Human/Man becomes coded as an abstract “humanity.” What remains is a homogenous and hegemonic population that reflects American social, cultural, and political norms. Space advocates fail to express or imagine the infinite possibilities of life in outer space, because they feel that they must project and perfect the ways of life of those who conquered the Americas.

As Linda Billings points out, the ideological foundations of the Final Frontier are exploitation and conquest (Billings, 2006). Yet, Turner’s definition of American values are not only ideological underpinnings, but also symptoms of American imperialism that stem from Puritan utopianism and patriarchal environmental relations. Through the Final Frontier, these cultural and political systems are linked in a definitive way as the content matches the material conditions of the times exemplified by the case of salvation/survival. Although the content may vary—from religious to secular, from mechanical to technological—the structure remains identical. The core message is “Save the People.” In Puritanism, the end is the end of the grace of God. In the context of capital, the apocalypse is the exhaustion of resources. In the Puritan narrative, the relation to native peoples and nature assumes the form of exploitation, because the indigenous peoples do not exist for themselves, but, rather, to test the soulfulness of real Human/Man (Stephanson, 1996). The ecosystem of the new world functioned in much the same way as the material world tested the faith and strength of the “explorers.”

Yet, the Final Frontier positions the universe for consumption and exploitation. The orientation of the Final Frontier is an orientation of antagonism; it is not about how a culture fits in harmony with the universe, but, rather, how that culture can expropriate and consume that culture. Experience versus use-value is a complicated aspect of the Final Frontier. Individualism values this antagonism, even when the conditions that will potentially structure human life in space may not accept or allow competition under such dramatically different conditions. Yet, the Final Frontier forces us to perceive outer space as some kind of resource that must be reduced to use-value, denying the possibilities of a purely aesthetic or singular encounter with the cosmos. The Final Frontier is a metaphor that welcomes and accommodates those who wish to exploit the Moon, the planets, and asteroids, yet excludes and repulses those who crave a more intimate and intuitive sense of the universe. The rational self must rationalize—to other people and larger systems—the desire to experience the cosmos. For Arthur C. Clarke, this urge to explore, to discover, and to “follow knowledge like a sinking star” was a primary human impulse that does not need, and cannot receive, further justification other than its own existence. As documents, “‘the search for knowledge,’ said a modern Chinese philosopher, ‘is a form of play.’ ‘Very well: we want to play with spaceships,’ said Arthur C Clarke.” (Bainbridge, 1976, p. 5). Yet, play does not always serve an acceptable epistemology. Play cannot be reconfigured to function as exploitation, and thus contributes nothing to either the economy or the nation-state. The narrowness and shallowness of the Frontier metaphor does not permit anything as useless and aleatory as play—or even cosmic awe—to enter outer space.

The Final Frontier, as a meaning-producing metaphor, both sabotages the space program and the future in space. It clings to an idea the past that offers nothing but dead ends. Due to this sabotage, the future in space is directed by whatever geo-political and economic circumstance arises. For instance, the Apollo paradigm and the domination of capitalism are contributing factors to these political and imaginative realms. In his attempt to make humans a “multi-planet” species, Elon Musk damns those who cannot afford the price of the ticket to salvation. Clearly, the future in space cannot be determined by capitalistic motivations or contemporary political needs.

Nonetheless, it is necessary to ask, what is it about these positions that makes it appear necessary to migrate to another planet or explore the universe? Western expansion—along with the development of capitalism—may become a model for the venture into space, as it is a migration into the “unoccupied world.” Whether it is Columbus, Captain Cook, or the Final Frontier, the conception of space and its purpose remain the same: resources for exploitation, as well as the necessary subhuman bodies for labour to develop it. Although the exploration of space appears to be the first or second justification, the basic motivation and only true justification—of the colonial Frontier metaphor—is exploitation: “I think therefore I am is based on I conquer therefore I am.” In this sense, the exploratory scientific elements of space exploration of “I think” serve the historical and future conquest of “I conquer” (Dussel et al., 2000). Consequently, both contemporary political and economic motivations can be directly linked to historical colonization and the logic of coloniality.

The parallels between outer space and the Western frontier are the result of the production of space as a social and political space. These social and political forms are bound to coloniality through systems of oppression, the nation-state, and the economic system of capitalism. As the violence of colonization is rendered historical (and as “there are no Indians . . . in outer space” (Williamson, 1987), colonization is a neutral, even technical, term. Those who use this language of colonization to describe space exploration fall into epistemological blind-spots, because they failure to engage with the history of various power structures and hegemonic discourses. This is one of the ways that Modernity/Coloniality perpetuates “dehumanization coordinates or foundations that serve to perpetuate the inferiority of some that superiority of others” (Maldonado-Torres, 2016). This is why, for example, space advocates can advocate for eugenics without understanding that what they see as the termination of pregnancy that may result in a child with disabilities is tantamount to speculative Martian forced abortion policy (Szocik et al., 2018). Szocik et al stated that “Western civilization evaluates human life as the most important value and human good,” yet see no paradox in their own devaluation of the lives of peoples with disabilities. Additionally, they fail to advocate or account for the wants and needs of the pregnant person. Esta rajadura—this crack—reveals the blatant socio-economic and political construction of this very idea of life. And esta rajadura—that crack—demands that a fuller and a more life-affirming future is possible insofar as these problems and constructions are not unknowingly perpetuated.

The use of humanist language is often Eurocentric and centres European cultures and principles, as seen in the “neutral” references to Columbus. As such, the humanist constructions of the human are the reproduction of the Human/Man. Zubrin, like Carl Sagan and his “successor” Neil deGrasse Tyson, uses universalizing humanist rhetoric to explain and justify space exploration, which he portrays as the inevitable outcome of Enlightenment values and techno-science. As Dickens and Ormrod state, “space development is (seen) as a solution to Earth’s problems” (Dickens, 2007). Yet, space advocates, instead of denouncing the violence of coloniality and capitalism, glorify it with coded humanist language. The problems for advocates are closed systems, overpopulation, lack of resources, and the “stagnation of western civilization” (Brown, 1978; Clarke, 1951; Ian A. Crawford, 2015; Elias, 1990; Foundation, 2019; Munevar, 2014; O'Neill, 1977, 1981; Szocik et al., 2018; R. Zubrin, 1999; Zubrin; & Wagner, 1996). And so, Zubrin writes that “the essence of humanist society is that it values human beings—human life and human rights are held precious beyond price” (Zubrin; & Wagner, 1996), and insists that life in the “New World” “raised the dignity of workers by raising the price of labor and by demonstrating for all to see that human beings can be the creators of their world” (1996, p. 299). Space Renaissance Initiative attributes the same development—the increase of the value of labor—to the Renaissance (2017). In either case, the labor that created humanist society was the labour of slaves, serfs, and other “colonized subjects” who were excluded from the very definition of “Human” that Humanism represented. Ironically, the humanism that Zubrin exalts represents the dehumanization of other populations. As such, it is likely that Zubrin’s vision of the future—the Final Frontier on Mars—will lead to similar dehumanizing patterns and practices.

#### The management of space debris, satellites, and asteroids is rooted in a militarized approach to the future that culminates in the *full-spectrum dominance* of the globe

**Reno ‘20** (Joshua Ozias Reno, Associate Professor of Anthropology at Binghamton University. PhD from the University of Michigan, “The Wrong Stuff”, chapter 4 of Military Waste: The Unexpected Consequences of Permanent War Readiness Univ of California Press, Feb 4, 2020 Pg. 127-130)DR 19

**Space debris** can be dangerous to orbiting vessels and, as such, it represents an ever-growing hazard to human uses of Earth space. But these objects are hard to track and easy to mistake for something else, even for people who spend all of their time looking up at the night sky. Like space exploration itself, this is a difficult problem to solve, so it is not surprising that **only the most powerful and prominent space agencies imagine they are capable of finding space debris**, let alone clearing it from orbital environments. A core dimension of that power and prominence, moreover, is about having military ambitions that extend beyond the surface of the planet. And, **from the very beginnings**, doing so has meant enrolling amateur or civilian scientists in DoD plans for outer-space. Historically, **solving space-related challenges has meant getting funds and resources from wealthy and powerful nations**. **With the growth of** a permanent war economy, **such expenditure** is very often **tied** **to** imagined or real military applications. Consequently, the history of space exploration has been and continues to be shaped by tensions and networks between **civilian and military** scientific objectives. But these seemingly opposed **groups** also align and become indistinguishable, especially insofar as they embrace a fascination with developing the latest technology and an unrelenting faith in its ability to solve all problems. This is also known as techno-solutionism. Evgeny Morozov (2013) developed this idea related to utopian appraisals of the internet. His account draws heavily on **Hannah Arendt’s** *On Violence* (1970), a book which openly criticizes **US administrations** that thought they could solve global problems through technically ingenuous forms of death and destruction. Broadly defined, techno-solutionism is faith that technical fixes can solve any problem…even when they are targeting a realm like **outer space**, one that is already saturated with the leftovers of generations of technological problem-solving. According to Gökçe Günel (2019, 129), any technical adjustment is not only about “functionality, effectiveness, or use, but rather the ways in which its materially and conceptually indeterminate existence mobilizes potential towards a technically adjusted future.” In this sense, **technical fixes for space debris are more about extending the possibility of future technical intervention in orbital environments**, rather than, for instance, **encouraging ethical reflection** on whether people should create debris at all. Space debris is not just any problem, it is **one that originated** **with** and threatens **space science** and, as such, shows the limits of technical solution-making in general. If it is problematic to see space debris as a technical glitch, as noise in an otherwise perfectly rendered human design, that is because such a view can **mislead us** into thinking that all it takes is a little more ingenuity, a bit more mastery, to solve the problem entirely. But, following Virilio (2007), every new technical innovation and improvement brings a new disaster, an unprecedented act of contamination. If **space debris represents inevitable traces** that human artifacts and projects leave behind in the space beyond Earth, then, whatever the future may hold, this problem is unavoidable. If people want to continue to escape their earthly confines, space debris will have to be reckoned with. Space debris is a possibility that haunts all uses of space *tout court*, rather than an incidental by-product of space exploration and travel. A focus on technical mastery links the cause of space debris with its proposed cure. As a counterpoint, I discuss how amateur astronomers and ham radio operators have engaged with space debris in a different manner and with altogether different goals. Specifically, they tend to look for ways to become attuned with and enliven debris that has been abandoned. Militarizing Civilian Science The possibility of a semiautonomous civilian space agency had defined space exploration from the start, but by the 1970s and ‘80s, funding had dropped precipitously from the heyday of the Apollo missions. By that time, NASA had come under widespread criticism as the country entered recession and other big programs (such as the CIA) and national initiatives (the War on poverty, Civil Rights Legislation, the Vietnam War) were attacked by political representatives and activists across the political spectrum. The prominent images that NASA members used to promote the organization during the 1960s was that of pragmatism, that space efforts would yield scientific benefits. This failed to improve the prestige of the organization within the government, until the Reagan era, when there was a resurgence of nationalist and romanticist rhetoric from earlier in NASA’s history. With the Reagan administration there was an effort, first, to block international efforts to ban weapons use in outer space and, second, to invest new symbolic importance and new financial resources in the militarization of space. Since that time, **solving space debris has become a common pursuit** of space agencies all over the world, both the more militarized and the more civilian among them. By the early 1980s, **satellites were central infrastructure**, particularly for the United States. The militarization of space had already occurred, in other words, and **without extravagant laser weapons**. Consequently, among the most central issues of the time was the testing and development of antisatellite weaponry (ASAT). The use of experimental ASAT has been partly responsible for reorienting international attention to space debris, since ASAT is a spectacular technology, the goal of which is to transform working satellites into unusable waste. Since satellites were so vulnerable to attack, and space treaties did not allow for the defense of particular regions of space as sovereign territory, satellites could be destroyed simply by sending “space mines” to collide with them. This constitutes one clear reason why DARPA and the Air Force are so intent on tracking space debris—they want to know whether satellites colliding with unidentified objects represent coincidental hazards or deliberate attacks. Being able to tell the difference between space debris and an actively launched space mine would be like knowing whether an ocean vessel sank because of an iceberg or a submarine. Even if one cannot capture space debris, being able to detect and identify it might be **necessary to predict or avoid war**. The ambiguities of witnessing discussed in the previous section, not knowing what one is seeing, therefore take on perilous consequences. While Reagan’s “Star Wars” and Trump’s “Space Force” have been heavily discussed and derided, other administrations have had similar designs. Perhaps most enduring has been the Clinton-era concept of *full-spectrum dominance*, first outlined in the United States Space Command “Vision for 2020” released in 1997. This relationship between outer space and defense and security has been so central to US policy that prominent advocates for science, notably Neil deGrasse Tyson, have authored reports suggesting that **NASA could be restored to its former glory by becoming more like DARPA**, that is, the militaristic organization it was partly created ***not to become***. In many ways the DoD’s Defense Advanced Research Projects Agency (**DARPA) is the epitome of techno-solutionist practice**. Though the term *defense* was only added to the acronym later (it was termed ARPA until 1972), **the agency was always closely linked to military interests and problem-solving**. In management studies, the concept of problems that are “DARPA-hard” has become widespread, with websites baiting visitors to see whether their company’s challenges would come close to qualifying. According to Leifer and Steinert (2011, 159), there are four criteria for the agency to consider something DARPA-hard: 1. Technically challenging (beyond current limits); 2. Actionable (proof of concept or prototype); 3. Multidisciplinary (complex); and 4. Far-reaching (advances on a grand scale, radical). At the turn of the century, **DARPA** clearly **determined that solving orbital space debris met these criteria**. Space debris fragments **exceeded the capabilities of the Air Force’s Space Surveillance Network** (SSN), it would take work with specialists from various fields, and the achievement of a solution would be legitimately global in impact. The only thing missing was proof of concept. Their first attempt at a solution was to work with MIT aeronautics labs to develop a specialized telescope to detect faint objects. In 2011, DARPA unveiled a massive new telescope, the Space Surveillance Telescope (SST), specially developed with MIT labs to identify space debris. In contrast with what DARPA spokespersons described as the “soda straw approach” of existing telescopes, the SST would allow wide-angle shots of the night sky, made possible by a much larger aperture and an advanced visual processing system. **In at least one report** provided to NBC, moreover, cleaning up space debris was linked directly with military objectives.

#### The alternative is a decolonial praxis, one that uses the cracks in coloniality and modernity to imagine new epistemologies and futures outside the us/them binary. This radical reimagination of outer space accepts the unknown, rejecting colonial imaginaries and endless consumption.

Trevino ‘20 [Natalie B. Trevino; The University of Western Ontario; 10-30-2020; “The Cosmos is Not Finished”; Western University Doctor of Philosophy Thesis; https://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=9976&context=etd; Accessed 4-16-2022] AK

Las Rajaduras are the cracks, the untruths, in the appearance of coloniality that reveal the faults and failings of the colonial matrix of power. It is these cracks in the colonial surface that intimate another world. A world in which many worlds are possible. The La Rajadura of the Human/Man is that only the rational exploiter is capable of a subject position that provides the false objectivity of Modernity. Other ways of being have been rendered invisible, unacceptable, or, in the neoliberal sense, unprofessional. In the western conception of nature, the La Rajadura is that the presumption that nature exists only to be exploited. To be human is to exploit; to be nature is to be exploited. Under the cosmic order of the Final Frontier, this relation of exploitation is the only relation expected or accepted. Las Rajaduras of the American Cosmic Order is dependence on What Has Been. The entrapment of the imagination by colonial imagery endlessly reproduces colonial man and colonized nature, which never moves towards any potential alternative futures. Most of the time, the Las Rajaduras of coloniality appear hidden because they are hegemonically produced as “the only way.” Yet, the way forward is not to heal or repair the cracks, but to show the Human/Man that Nepantla, the everlasting transitionary place, can foster the conditions to produce a multitude of ways of knowing and being. Currently, the Final Frontier is a cosmic order in which the Human/ Man is only connected to Nature through consumption. All his practices, whether recreational, economic, or military, lead to exploitation. Human/Man remains outside of the cosmos as the cosmos is reified and consumed as an external resource. This is a totalizing cosmology. As long as this remains the dominant relation, no other relations can exist.

Cosmic Hope is the expression of possibilities; it is the committed act of imagining the impossible to engage with the real world. Cosmic Hope is the acceptance of the unknown, which leads to movement and change. Cosmic hope is much like the poet John Keats’ conception of negative capability: “it is the capability of being in uncertainties, mysteries, doubts, without any irritable reaching after fact and reason” (1939). Or, to quote Rainer Maria Rilke, “it is to live the questions” (1984). Cosmic Hope is the acceptance of, and ability to, contain doubt without striving for hegemonic certainty.

Cosmic Awe is an innate aesthetic appreciation and sense of overwhelming amazement that arises from seeing/sensing the vastness of the cosmos. Cosmic Awe flies in the face of the Human/Man’s relationship to Nature, as it is a relationship based on sensory experience of the cosmos, rather than the consumption of. There is a vastness to this awe: “Awe and wonder [are] phenomena [that] stretch our cognitive capacities beyond what can be mastered out of already existing knowledge structures, hence leading to a broadening of available mental representations” (Weger & Wagemann, 2018). This is the critical edge of embracing new, old, and other epistemologies. It springs from the recognition that there is so much beyond Western Modernity. The abandonment of Modernity/Coloniality is not only the end of the West, but also the birth of the world. Cosmic Awe is not yet fully accessible. Yet, it is clear that space exploration has profound and life-changing effects on many astronauts (White, 1987; Yaden et al., 2016). This is why negative capability is essential to space exploration as adjusting to uncertainty will reduce anxiety about possible futures.

Cosmic Revolution is the necessity of adapting to the material conditions of space. It is the active formation or reformation of ways of being, seeing, and doing. It is the working through uncertainty, and “rewriting reality” (Anzaldúa, 2015). Within Cosmic Revolution, there is the El Mundo Zurdo: the world of many worlds (Anzaldúa, 2015; Anzaldúa, 1986; Keating, 2008; Marcos, 2006). The Cosmic Revolution is fighting for possibilities on this world and on others. It rejects von Braun’s future and the Killian formula, and moves beyond western civilization. Yet it does not create the opposite of those futures, formulas, or cultures, but, rather, transcends them. It embraces the best aspects of Modernity, while rejecting its oppressiveness. It is welcoming of old and new epistemologies.

What in this world of historical and present oppression, in which a pandemic is sweeping across the face of the planet, reveals the cracks in the masks of Capitalism? The violence of white supremacy has been confronted and challenged by protests and riots across the United States, with acts of solidarity appearing around the world. These actions articulate the hope in the darkness that roams the surface of the earth. There is no academic explanation that I can offer, as every moment of hope requires a kind of inexplicable faith. The dichotomy between the cities on fire in rebellion and the launch of the SpaceX rocket reflects the conditions of coloniality perfectly. While historically oppressed peoples fight for a relation that is not exploitation, the Human/Man ventures to explore the Outside for the purposes of someday exploiting the cosmos

What is the hope of the future? This world is on fire, yet space could become the source of salvation for capitalism. This is a possibility of Not Yet. There is potential for things to go terribly wrong. Yet, through an engagement with Cosmic Hope and awe, space exploration can become an engagement with Nepantla that leads to different worlds, both physical and conceptual. This Cosmic Hope is a form of decolonized hope—a hope that cannot yet exist in its fullest sense. Cosmic Hope is a revolutionary praxis that grows, that blooms from the cracks of the colonial and capitalist world paradigms. Cosmic Hope grows from Las Rajaduras, the possibility of truth to come out of untruth. It is a Hope of the Not Yet; it is a Hope of those long dead and those yet to be born. Coloniality is a darkness, but a darkness that, like the darkest of nights, shows the distant lights of the stars and planets so far away. The stars are like Las Rajaduras. To see them, you must be in the darkness. That is what this work has attempted to do: to define the darkness that is coloniality yet reveal the stars that can show a different world. It is only in darkness that the stars shine bright. In the words of Paulo Freire, “The dehumanization resulting from an unjust order is not a cause for despair but for hope, leading to the incessant pursuit of the humanity denied by injustice (Freire, p. 91-92).” It is from this perspective I move forward. Freire, again: “Hope is rooted in men’s (sic) incompletion, from which they move out in constant search—a search which can be carried out only in communion with others (p. 91).”

This is why one of the ways that we can practice decoloniality within the framework of space exploration—within cosmology more generally—is by taking advantage of the cracks within these structures that emerge from decolonial praxis. What I have strived to do in the previous chapters is produce an account of the coloniality of American space exploration and reveal its decolonial cracks. The question remains: how do we use these cracks? In this chapter, I take inspiration from the thought, style, and words of Anzaldúa to offer an elusive glimpse at the possibilities of Cosmic Hope, Cosmic Awe, and Cosmic Revolution. As Anzaldúa writes, “Las Rajaduras [the cracks] give us a Nepantla perspective, a view from the cracks ...[that] enables us to reconfigure ourselves as subjects out the us/them binary...to construct alternative roads, create new topographies and geographies ...look at the world with new eyes, use competing systems of knowledge, and rewrite identities. Navigating the cracks is the process of reconstructing life anew” (Anzaldúa via Walsh, OD, p 83). I pray that this chapter will contribute to this process of reconstructing life anew.

#### Utilitarian calculus doesn’t account for the geopolitical structure of aggregate conceptions of the good – that makes it incapable of grappling with the causes of apocalypse.

Grove ‘19

[Jarius, PoliSci at the University of Hawai’i. 2019. “Savage Ecology: War and Geopolitics in the Anthropocene.”] pat – ask me for the PDF!

Rather than see these two career trajectories as opposed, I think Crutzen’s thinking displays a continuous concern for the Northern Hemisphere and a particular cartography, rather than a geography, of human survival. Crutzen, as well as the concept of the Anthropocene itself, cannot escape preceding geopolitical conceptions of the Earth. Crutzen and others who rush so quickly to the necessity to transition efforts from climate abatement to climate modification are unsurprisingly not moved by claims that artificial cooling will likely cause droughts and famines in the tropics and subtropical zones of the global south; nor are they moved by how such plans may accelerate ocean acidification. The utilitarian risk calculus that favors the greatest good for the greatest number has no geographical or historical sensibility of how unequally aggregate conceptions of the good are distributed around the planet.

Global thinking, even in its scientific and seemingly universalist claims to an atmosphere that “we” all share, belies the geopolitics that enlivens scientific concern, as well as the global public policy agenda of geoengineering that seeks to act on behalf of it. Saving humanity as an aggregate, whether from nuclear war, Styrofoam, or climate turbulence, has never meant an egalitarian distribution of survivors and sacrifices. Instead, our new cosmopolitanism—the global environment—follows almost exactly the drawn lines, that is, the cartography or racialized and selective solidarities and zones of indifference that characterize economic development, the selective application of combat, and, before that, the zones of settlement and colonization. More than a result of contemporary white supremacy or lingering white privilege, the territorialization of who lives and who dies, who matters and who must be left behind for the sake of humanity, represents a five-hundred-year geopolitical tradition of conquest, colonization, extraction, and the martial forms of life that made them all possible through war and through more subtle and languid forms of organized killing.

I am not suggesting that Crutzen and others are part of a vast conspiracy; rather, I want to outline how climate change, species loss, slavery, the elimination of native peoples, and the globalization of extractive capitalism are all part of the same global ordering. That is, all of these crises are geopolitical. The particular geopolitical arrangement of what others have called the longue durée, and what I am calling the Eurocene, is geologically significant but is not universally part of “human activity” despite the false syllogism at the heart of popular ecological thinking that a global threat to humanity must be shared in cause and crisis by all of humanity.

Departing from Sloterdijk, I am hesitant to so easily locate modernity or explication as the root or cause of the global catastrophe. No single strategy, war, act of colonization, technological breakthrough, or worldview fully explains the apocalypse before us. However, there is something like what Gilles Deleuze and Félix Guattari call a refrain that holds the vast assemblage together, a geopolitical melody hummed along with the global expansion of a form of life characterized by homogenization rather than diversification. Accordingly, if we are to make some sense of such a vast world that is, even for Crutzen and Birks, “quite complex and difficult to model,” I think we must consider the particular refrain of geopolitics that is capable of, by scientific as well as more humbly embodied standards, destroying worlds along with the world. To eschew geopolitics simply because, as a refrain, it is too big, too grand, or too universal would ignore the conditions of possibility for nuclear weapons, power politics, and carbon-based globalization, and would greatly impoverish the explanatory capability of even the best climate models. So maybe it is not so strange that Crutzen and others’ attention to the nuclear threat of great powers has all but disappeared despite the fact that Russia and the United States still possess thousands of nuclear weapons, and as of late have been all too vocal about using them. Instead, the Anthropocene, as envisioned by Crutzen as a universal concern, requires with it a depoliticization of the causes of that concern.

## 3

### 1NC – DA

#### SpaceX satellites are key to internet access

James Pethokoukis 11/30 [James Pethokoukis, a columnist and an economic policy analyst, is the Dewitt Wallace Fellow at the American Enterprise Institute, where he writes and edits the AEIdeas blog and hosts a weekly podcast, “Political Economy with James Pethokoukis.” He is also a columnist for The Week and an official contributor to CNBC. “Why a SpaceX bankruptcy would hurt the global poor” Faster, Please! November 30, 2021 <https://fasterplease.substack.com/p/-why-a-spacex-bankruptcy-would-hurt>

I don’t have enough deep knowledge about SpaceX’s business or financials to reliably gauge the actual bankruptcy risk here, and the piece’s reporter is skeptical. I will note, however, that although the company is currently valued at around $100 billion, the bank Morgan Stanley assigns it a valuation “of somewhere between $5bn and $200bn, with uncertainty about its success accounting for the wide range,” according to The Economist. Starship and Starlink are key to that upper bound. (Also: A Morgan Stanley survey of “institutional investors and industry experts” expect SpaceX to become more valuable than Tesla, currently a trillion-dollar company. We’ll see.) So it’s not surprising that Musk emphasizes the importance of the Starlink internet satellite venture here, especially its next incarnation. Now go and Twitter search on the terms “Musk,” “ruining,” and “sky,” and you’ll find plenty of complaints about the Starlink constellation — with currently more than 1,700 satellites in low-Earth orbit. For many of these keyboard critics, Starlink is nothing more than an uberbillionaire's reckless effort to become an even wealthier uberbillionaire. Or maybe it’s just another Muskian vanity project, like building rockets to Mars. Either way, these diehard anti-Muskers see a cluttered sky for visual astronomers, both amateur and professional, as a horrific tradeoff just so the entrepreneur can sell global internet access. Now, the extreme version of this critique is unserious, little more than anti-billionaire emoting. The profit potential of Starlink is unclear, though it seems to be Musk’s goal that the telecom business will one day help fund his Mars ambitions. But the venture isn’t there yet. Last summer, Musk estimated that Starlink would likely need between $20 billion and $30 billion in investment. "If we succeed in not going bankrupt, then that'll be great, and we can move on from there," Musk said. For now, Starlink aims to add another 1,000 satellites a year, even more when Starship is operational. That is, assuming Starship become operational. But the astronomy issue is a real one, as SpaceX has acknowledged. And after astronomer complaints about the brightness of the first group of 60 satellites launched in 2019, SpaceX developed a work-around to minimize the glare from solar reflection on subsequent launches. Of course, some scientists don’t want to rely on the goodwill of SpaceX and other satellite companies. They see an international regulatory agreement, perhaps a new protocol under the Outer Space Treaty, as a necessity. But as such an add-on is unlikely to happen anytime soon, notes The Economist, “not least because other issues raised by the mega constellations, such as risks from debris, will doubtless seem more pressing.” Here’s one of the many pictures floating around the Internet showing the impact of Starlink satellites — “the 333-second exposure shows at least 19 satellites passing overhead” — on astronomical observations, via the IFLScience website: Of course, framing the trade-off as the above picture vs. “better global internet” doesn’t quite capture the benefits of the latter. And they are considerable. There remains a stark digital divide in global internet access. As the World Economic Forum notes: “Globally, only just over half of households (55 percent) have an internet connection, according to UNESCO. In the developed world, 87 percent are connected compared with 47 percent in developing nations, and just 19 percent in the least developed countries.” It seems pretty clear that broadband internet access brings considerable economic gains, particularly to poorer countries. (Musk has specifically said this is a goal of Starlink.) Here are a few examples from the August 2021 analysis “The Economic Impact of Internet Connectivity in Developing Countries” by Jonas Hjort (Columbia University) and Lin Tian (INSEAD): Quite a few studies convincingly estimate the effect on consumption of specific internet-enabled technologies (rather than internet connectivity itself) through model-based approaches, and a few do so more directly. Jack & Suri (2014) show that access to mobile money decreased consumption poverty by two percentage points in Kenya. In contrast, Couture et al. (2021) finds that expansion of e-commerce in China has little effect on income to rural producers and workers. Different areas of Sub-Saharan Africa got access to basic internet at different times starting in the early 2000s. Exploiting variation arising from the gradual arrival of submarine cable connections and using nighttime satellite image luminosity as a proxy for economic activity, Goldbeck & Lindlacher (2021) estimate that basic internet availability leads to about a two percentage point increase in economic growth. As we briefly discussed in Sub-section 3.1.1, Bahia et al. (2020) show evidence that the gradual roll-out of mobile broadband in Nigeria between 2010 and 2016 increased labor force participation and employment. The paper also shows that household consumption simultaneously increased and poverty decreased. Households that had at least one year of mobile broadband coverage experienced an increase in total consumption of about 6 percent. Masaki et al. (2020) document a similarly striking result. Combining household expenditure surveys with data on the location of fiber-optic transmission nodes and coverage maps of 3G mobile technology, they show that 3G coverage is associated with a 14 percent increase in total consumption and a 10 percent decline in extreme poverty in Senegal. Finally, Bahia et al. (2021) use a similar empirical approach to study the effect of mobile broadband roll-out in Tanzania and find a comparable increase in household consumption and decline poverty in this setting. The eventual endgame here is that there are going to be many tens of thousands more satellites in orbit, enabling total global internet coverage. And they will be joined by all manner of human-occupied installations for tourist, commercial, and scientific endeavors. (You may have missed the late October announcement that Blue Origin, the space company owned by Jeff Bezos, is teaming up with other firms to build a space station in Earth orbit.) Stargazing from Earth will never be the way it used to be. Then again, people still complain about shadows from skyscrapers even as humanity continues to build them. But recall one of the running themes of this newsletter: Technology solves one problem, creates another, then solves that one — rinse and repeat — even as the overall direction is forward. More astronomy in the future will be space based. And if all those space objects and structures make even low-Earth orbit astronomy difficult, more of it will need to be performed further out, as with the James Webb Space Telescope. Or maybe via telescopes on the Moon, such as the proposed Lunar Crater Radio Telescope, which would deploy robots to transform a half-mile wide crater into an observatory by attaching a wire mesh along the crater walls. And once there are lots of satellites around a fully colonized Moon, off to Mars — which might be accessible thanks to Starlink funding Musk’s deep-space ambitions. Meanwhile, there will be a lot less global poverty here on Earth than otherwise.

#### Internet access checks multiple existential threats

Eagleman ’10 [Dr. David; 11/9/2010; PhD in Neuroscience @ Baylor University, Adjunct Professor of Neoroscience @ Stanford University, Former Guggenheim Fellow, Director of the Center for Science and Law, BA @ Rice University; “Six Ways The Internet Will Save Civilization”; https://www.wired.co.uk/article/apocalypse-no]

Many great civilisations have fallen, leaving nothing but cracked ruins and scattered genetics. Usually this results from: natural disasters, resource depletion, economic meltdown, disease, poor information flow and corruption. But we’re luckier than our predecessors because we command a technology that no one else possessed: a rapid communication network that finds its highest expression in the internet. I propose that there are six ways in which the net has vastly reduced the threat of societal collapse.

Epidemics can be deflected by telepresence

One of our more dire prospects for collapse is an infectious-disease epidemic. Viral and bacterial epidemics precipitated the fall of the Golden Age of Athens, the Roman Empire and most of the empires of the Native Americans. The internet can be our key to survival because the ability to work telepresently can inhibit microbial transmission by reducing human-to-human contact. In the face of an otherwise devastating epidemic, businesses can keep supply chains running with the maximum number of employees working from home. This can reduce host density below the tipping point required for an epidemic. If we are well prepared when an epidemic arrives, we can fluidly shift into a self-quarantined society in which microbes fail due to host scarcity. Whatever the social ills of isolation, they are worse for the microbes than for us.

The internet will predict natural disasters

We are witnessing the downfall of slow central control in the media: news stories are increasingly becoming user-generated nets of up-to-the-minute information. During the recent California wildfires, locals went to the TV stations to learn whether their neighbourhoods were in danger. But the news stations appeared most concerned with the fate of celebrity mansions, so Californians changed their tack: they uploaded geotagged mobile-phone pictures, updated Facebook statuses and tweeted. The balance tipped: the internet carried news about the fire more quickly and accurately than any news station could. In this grass-roots, decentralised scheme, there were embedded reporters on every block, and the news shockwave kept ahead of the fire. This head start could provide the extra hours that save us. If the Pompeiians had had the internet in 79AD, they could have easily marched 10km to safety, well ahead of the pyroclastic flow from Mount Vesuvius. If the Indian Ocean had the Pacific’s networked tsunami-warning system, South-East Asia would look quite different today.

Discoveries are retained and shared

Historically, critical information has required constant rediscovery. Collections of learning -- from the library at Alexandria to the entire Minoan civilisation -- have fallen to the bonfires of invaders or the wrecking ball of natural disaster. Knowledge is hard won but easily lost. And information that survives often does not spread. Consider smallpox inoculation: this was under way in India, China and Africa centuries before it made its way to Europe. By the time the idea reached North America, native civilisations who needed it had already collapsed. The net solved the problem. New discoveries catch on immediately; information spreads widely. In this way, societies can optimally ratchet up, using the latest bricks of knowledge in their fortification against risk.

Tyranny is mitigated

Censorship of ideas was a familiar spectre in the last century, with state-approved news outlets ruling the press, airwaves and copying machines in the USSR, Romania, Cuba, China, Iraq and elsewhere. In many cases, such as Lysenko’s agricultural despotism in the USSR, it directly contributed to the collapse of the nation. Historically, a more successful strategy has been to confront free speech with free speech -- and the internet allows this in a natural way. It democratises the flow of information by offering access to the newspapers of the world, the photographers of every nation, the bloggers of every political stripe. Some posts are full of doctoring and dishonesty whereas others strive for independence and impartiality -- but all are available to us to sift through. Given the attempts by some governments to build firewalls, it’s clear that this benefit of the net requires constant vigilance.

Human capital is vastly increased

Crowdsourcing brings people together to solve problems. Yet far fewer than one per cent of the world’s population is involved. We need expand human capital. Most of the world not have access to the education afforded a small minority. For every Albert Einstein, Yo-Yo Ma or Barack Obama who has educational opportunities, uncountable others do not. This squandering of talent translates into reduced economic output and a smaller pool of problem solvers. The net opens the gates education to anyone with a computer. A motivated teen anywhere on the planet can walk through the world’s knowledge -- from the webs of Wikipedia to the curriculum of MIT’s OpenCourseWare. The new human capital will serve us well when we confront existential threats we’ve never imagined before.

Energy expenditure is reduced

Societal collapse can often be understood in terms of an energy budget: when energy spend outweighs energy return, collapse ensues. This has taken the form of deforestation or soil erosion; currently, the worry involves fossil-fuel depletion. The internet addresses the energy problem with a natural ease. Consider the massive energy savings inherent in the shift from paper to electrons -- as seen in the transition from the post to email. Ecommerce reduces the need to drive long distances to purchase products. Delivery trucks are more eco-friendly than individuals driving around, not least because of tight packaging and optimisation algorithms for driving routes. Of course, there are energy costs to the banks of computers that underpin the internet -- but these costs are less than the wood, coal and oil that would be expended for the same quantity of information flow.

The tangle of events that triggers societal collapse can be complex, and there are several threats the net does not address. But vast, networked communication can be an antidote to several of the most deadly diseases threatening civilisation. The next time your coworker laments internet addiction, the banality of tweeting or the decline of face-to-face conversation, you may want to suggest that the net may just be the technology that saves us.

## Case

### Framing

### Advantage

#### Interdependence checks space war.

**Hall 15** [Luke Penn-Hall 15, Analyst at The Cipher Brief, M.A. from the Johns Hopkins School for Advanced International Studies, B.A. in International Relations and Religious Studies from Claremont McKenna College, “5 Reasons “Space War” Isn’t As Scary As It Sounds”, The Cipher Brief, 8/18/2015, <https://www.thecipherbrief.com/article/5-reasons-%E2%80%9Cspace-war%E2%80%9D-isn%E2%80%99t-scary-it-sounds>] recut Adam

The U.S. depends heavily on military and commercial satellites. If a less satellite-dependent opponent launched an anti-satellite (ASAT) attack, it would have far greater impact on the U.S. than the attacker. However, it’s not as simple as that – for the following reasons:

1. An ASAT attack would likely be part of a larger, terrestrial attack. An attack on space assets would be no different than an attack on territory or other assets on earth. This means that no space war would stay limited to space. An ASAT campaign would be part of a larger conventional military conflict that would play out on earth.

2. Every country with ASAT capabilities also needs satellites. While the United States is the most dependent on military satellites, most other countries need satellites to participate in the global economy. All countries that have the technical ability to play in this space – the U.S., Russia, China and India - also have a vested interest in preventing the militarization of space and protecting their own satellites. If any of those countries were to attack U.S. satellites, it would likely hurt them far more than it would hurt the United States.

3. Destruction of satellites could create a damaging chain reaction. Scientists warn that the violent destruction of satellites could result in an effect called an ablation cascade. High-velocity debris from a destroyed satellite could crash into other satellites and create more high-velocity debris. If an ablation cascade were to occur, it could render certain orbital levels completely unusable for centuries.

4. Any country that threatened access to space would threaten the global economy. Even if a full-blown ablation cascade didn’t occur, an ASAT campaign would cause debris, making operating in space more hazardous. The global economy relies on satellites and any disruption of operations would be met with worldwide disapproval and severe economic ramifications.

5. International Prohibits the Use of ASAT Weapons. Several international treaties expressly prohibit signatory nations from attacking other countries’ space assets. It is generally accepted that space should be treated as a global common area, rather than a military domain.

While it remains necessary for military planners to create contingency plans for a, space war it is a highly unlikely scenario. All involved parties are incentivized against attacking. However, if a space war did occur, it would be part of a larger conflict on Earth. Those concerned about the potential for war in space should be more concerned about the potential for war, period.

#### Ozone is non-unique – we read blue

**1AC Rosenberg 21**

(Lizzy, <https://www.greenmatters.com/p/what-happens-ozone-layer-gone>, 9-17)

Climate change is continuously threatening plant and wildlife, it's causing extreme weather conditions, and it's the reason why water levels and temperatures are continuously rising. But one of the more threatening side effects of climate change is the daunting hole that's formed in the ozone layer over the years. Scientists attribute it to destructive human activity — specifically the use of chlorofluorocarbons and aerosols — and the prospect of the ozone layer being totally gone is terrifying. "Ozone is Earth's natural sunscreen, absorbing and blocking most of the incoming UV radiation from the sun and protecting life from DNA-damaging radiation," reads a report from NASA. That said, a world without it could be pretty bleak. What will happen if the ozone layer is gone? As previously mentioned, the ozone player protects life on planet Earth from exposure to UV rays and radiation. The stratospheric layer, which lies 10 to 30 miles above Earth's surface, consists of naturally created ozone molecules. **But in the 1970s, researchers discovered a "hole" in the ozone that was caused by the use of CFCs, which destroy ozone molecules**, according to NASA. And as per the EPA, **the hole is causing more UV radiation to make its way to life on planet Earth**. UV ray exposure can cause skin cancer, cataracts, and immune system problems among human beings. as well as famine in humans and wildlife due to lower crop yield and destruction of marine life. So if the hole in the ozone layer gets much bigger — or if the ozone layer depletes entirely — it could cause increased life-threatening problems to human, animal, and plant life. It could ultimately make **planet Earth truly uninhabitable** — even more than it is as of right now.

**Probability – 0.1% chance of a collision.**

Alexander William **Salter**, **Economics Professor at Texas Tech**, **’16**, “SPACE DEBRIS: A LAW AND ECONOMICS ANALYSIS OF THE ORBITAL COMMONS” 19 STAN. TECH. L. REV. 221 \*numbers replaced with English words

The probability of a collision is currently **low**. Bradley and Wein estimate that the **maximum probability** in LEO of a collision over the lifetime of a spacecraft remains **below one in one thousand**, conditional on continued compliance with NASA’s deorbiting guidelines.3 However, the possibility of a future “snowballing” effect, whereby debris collides with other objects, further congesting orbit space, remains a significant concern.4 Levin and Carroll estimate the average immediate destruction of wealth created by a collision to be approximately $30 million, with an additional $200 million in damages to all currently existing space assets from the debris created by the initial collision.5 The expected value of destroyed wealth because of collisions, currently small because of the low probability of a collision, can quickly become significant if future collisions result in runaway debris growth.

#### Asteroids aren’t a threat – your evidence

**Dreier 21**

(Casey Dreier is Senior Space Policy Adviser for The Planetary Society, an independent nonprofit organization based in California. <https://www.scientificamerican.com/article/why-an-asteroid-strike-is-like-a-pandemic/>, 7-25)

Imagine the following scenario. Scientists identify a potential global threat, but initial data are spotty—not enough to spur drastic action. Rapidly, relentlessly, the threat grows. What once was preventable becomes inevitable. The world has no choice but to endure the disaster at the cost of trillions of dollars and millions of lives. This is the story of COVID pandemic—but it could equally well be the story of a **catastrophic strike by a large asteroid**. As we emerge from the worst of COVID-19, we should heed this lesson: **low-probability, high-impact events do occur; but they can be mitigated if we prepare and act early enough**. Asteroids are like viruses in a sense: they number in the tens of millions but only a few types pose a threat to humans. For asteroids, it’s the “near-Earth” variety—those with orbits that come close to our own—that we must worry about. Also as with viral outbreaks, the likelihood of a catastrophe is unlikely in any given year, but **almost inevitable over time**. And just as we can in principle develop vaccines against emerging viruses before they cause too much damage, creating immunity without making people sick, we can similarly use modern technology to develop a level of global immune response to asteroid collisions. But this requires ongoing investments in research and preparedness—and while the U.S. spent more than $6.5 billion dollars on pandemic preparedness over the past decade (with admittedly mixed results), the nation spent less than a tenth of that on the work of asteroid detection and deflection. This is far too low. In fact, **impacts from space happen all the time, but they are generally small and harmless**. **The Earth is peppered with meteors throughout the year that are mere inches across or less, which burn up as shooting stars when they enter our atmosphere**. The threat comes from the bigger ones, which are house-sized or larger. These strike less frequently, but they do happen. In 2013, a 60-foot-diameter meteor exploded over the city of Chelyabinsk, injuring thousands of people. The really big ones—miles across—are even rarer, occurring every few hundred million years or so. **But the damage they do can be catastrophic**. **Think of the mass extinction** 65 million years ago that wiped out most of the dinosaurs. The good news is that we’ve found most of those and, fortunately for us, Earth is not in their crosshairs. But there is a middle ground that demands our attention: “city killer” asteroids that are about around the size of a football field and could unleash 10,000 times the energy of the atomic bomb that leveled Hiroshima. They seem to hit us every few thousand years, on average. There are likely many tens of thousands of them with orbits near Earth’s, yet we’ve only found about one third of these. And finding them is hard. Even the big ones are tiny, cosmically speaking, and are camouflaged against the blackness of space by their charcoal-like dark surfaces. Ground-based telescopes, which measure reflected light, **struggle to see these small, dim objects**. Only a few hundred are discovered each year. To significantly improve the rate of detection we need to move off the Earth, to the realm of the asteroids. We need a telescope in space. The Near-Earth Object (NEO) Surveyor is a modest space telescope currently under consideration by NASA. Instead of looking at reflected light, it would seek out heat signatures of asteroids, which glow with infrared radiation against the cold background of space. And in space, where there’s no bad weather and daytime that limit observations, the NEO Surveyor could find more city-killer asteroids in the next 10 years than have been discovered by all the telescopes on Earth over the past three decades. ADVERTISEMENT The mathematics of orbital mechanics that characterizes asteroids can be as heartless as the exponential growth that goes with viral outbreaks. And as with broad testing regimes that have been used during COVID, **a dedicated effort to discover potentially hazardous asteroids will be the key to preventing disaster**. It’s possible to alter an incoming asteroid’s orbit to protect the Earth, but that becomes increasingly more difficult depending on how close we are to impact. It is far easier to act years (if not decades) in advance. After more than a decade in bureaucratic purgatory, where the NEO Surveyor has struggled to gain approval, the project appears ready to move forward. The Biden administration recently proposed to fund this mission in its latest NASA budget; Congress should support this request. It will take years to build and launch, but as early as 2026 we may see the start of the first dedicated effort to understand the scope of the asteroid threat. We also need to invest in deflection technology, the “vaccine” of the asteroid response. Fortunately, NASA is close to launching a mission called the Double Asteroid Redirection Test (DART). In 2022, the spacecraft will ram into the tiny “moon” that orbits the near-Earth asteroid Didymos, slightly changing its orbit. Scientists will compare the exact degree of change to their predictions, which will help them understand how to alter asteroid orbits more effectively in the future. This is only a test, but it could serve the same function as the years of basic research into the field of mRNA vaccines that ultimately paid off when applied to COVID. We must also continue to support sky surveys by ground telescopes, which can support the work of space-based missions. **The Vera Rubin Observatory**, for example, now under construction **in Chile and especially good at finding fast-moving objects in the solar system, will greatly assist in asteroid detection**. (The **proposed “megaconstellations**” of Earth-orbiting satellites by Amazon, SpaceX, OneWeb, and others threaten to overwhelm our view of these dim objects and make asteroid **detections more difficult**. **There is no easy solution to this**, beyond further confirming the need for space-based detectors located in quieter regions of the solar system.) The coronavirus pandemic has many humbling lessons for humanity. But let this be one of them: low-probability, high-impact disasters do occur; and there is no **higher impact disaster than** a large asteroid collision with the Earth. We know that early awareness enables early action. Big problems later on can be prevented by small investments now. Let’s not be caught off-guard again.