## 1

### 1nc – t

#### Interpretation: the aff cannot specify a type of space appropriation

#### Bare plurals imply a generic “rules reading” in the context of moral statements

Cohen 1 — (Ariel Cohen, Professor of Linguistics @ Ben-Gurion University of the Negev, PhD Computational Linguistics from Carnegie Mellon University, “On the Generic Use of Indefinite Singulars”. Journal of Semantics 18: 183-209, Oxford University Press, 2001, accessed 12-7-20, HKR-AM) \*\*BP = bare plurals

According to the rules and regulations view, on the other hand, generic sentences do not get their truth or falsity as a consequence of properties of individual instances. Instead, generic sentences are evaluated with regard to rules and regulations, which are basic, irreducible entities in the world. Each generic sentence denotes a rule; if the rule is in effect, in some sense (different theories suggest different characterizations of what it means for a rule to be in effect), the sentence is true, otherwise it is false. The rule may be physical, biological, social, moral, etc. The paradigmatic cases for which this view seems readily applicable are sentences that refer to conventions, i.e. man-made, explicit rules and regulations, such as the following example (Carlson 1995: 225):

(40) Bishops move diagonally.

Carlson describes the two approaches as a dichotomy: one has to choose one or the other, but not both. One way to decide which approach to choose is to consider a case where the behavior of observed instances conflicts with an explicit rule. Indeed, Carlson discusses just such a case. He describes a supermarket where bananas sell for $0.49/lb, so that (41a) is true. One day, the manager decides to raise the price to $1.00/lb. Immediately after the price has changed, claims Carlson, sentence (41a) becomes false and sentence (41b) becomes true, although the overwhelming majority of sold bananas were sold for $0.49/lb.

(41) a. Bananas sell for $0.49/lb.

b. Bananas sell for $1.00/lb.

Consequently, Carlson reaches the conclusion that the rules and regulations approach is the correct one, whereas the inductivist view is wrong.

While I share Carlson’s judgements, I do not accept the conclusion he draws from them. Suppose the price has, indeed, changed, but the supermarket employs incompetent cashiers who consistently use the old price by mistake, so that customers are still charged $0.49/lb. In this case, I think there is a reading of (41a) which is true, and a reading of (41b) which is false. These readings are more salient if the sentence is modified by expressions such as actually or in fact:

(42) a. Bananas actually sell for $0.49/lb.

b. In fact, bananas sell for $1.00/lb.

BP generics, I claim, are ambiguous: on one reading they express a descriptive generalization, stating the way things are. Under the other reading, they carry a normative force, and require that things be a certain way. When they are used in the former sense, they should be analysed by some sort of inductivist account; when they are used in the latter sense, they ought to be analysed as referring to a rule or a regulation. The respective logical forms of the two readings are different; whereas the former reading involves, in some form or another, quantification, the latter has a simple predicate-argument structure: the argument is the rule or regulation, and the predicate holds of it just in case the rule is ‘in effect’.

#### Violation—they specified LEOs

#### Vote neg for predictable limits—specifying a type of appropriation offers a huge explosion in the topic since they get permutations of hundreds of appropriations. Limits explodes neg prep burden and draws un-reciprocal lines of debate, where the aff is always ahead.

#### Topicality is a voting issue that should be evaluated through competing interpretations – it tells the negative what they do and do not have to prepare for—there’s no way for the negative to know what constitutes a “reasonable interpretation” when we do prep – reasonability is arbitrary and causes a race to the bottom, proliferating abuse

## 2

### 1nc – t

#### T – Appropriation:

#### Interpretation: Appropriation means use, exploitation, or occupation that is permanent and to the exclusion of others

Babcock 19 Professor of Law, Georgetown University Law Cente. Babcock, Hope M. "The Public Trust Doctrine, Outer Space, and the Global Commons: Time to Call Home ET." Syracuse L. Rev. 69 (2019): 191.

Article II is one of those succeeding provisions that curtails “the freedom of use outlined in Article [I] by declaring that outer space, including the [m]oon and other celestial bodies, is not subject to national appropriation.”147 It flatly prohibits national appropriation of any celestial body in outer space “by means of use or occupation, or by any other means.”148 However, “many types of ‘use’ or ‘exploitation’. . . are inconceivable without appropriation of some degree at least of any materials taken,” like ore or water.149 If this view of Article II’s prohibitory language is correct, then “it is not at all farfetched to say that the OST actually installs a blanket prohibition on many beneficial forms of development.”150 However, the OST only prohibits an appropriation that constitutes a “long-term use and permanent occupation, to the exclusion of all others.”151

#### Violation: Orbits aren’t appropriated because they don’t provide property rights and they can’t be privately owned – even if it appears defacto because it can exclude rivals, that’s legally distinct from appropriation

Matignon 19 [Louis de Gouyon Matignon, PhD in space law (co-supervised by both Philippe Delebecque, from Université Paris 1 Panthéon-Sorbonne, France, and Christopher D. Johnson, from Georgetown University, Washington D.C.); "ORBITAL SLOTS AND SPACE CONGESTION." spacelegalissues.com/orbital-slots-and-space-congestion/]

Orbital slots – the “parking spots” of outer space – are allocated to telecom operators via national administrations by the International Telecommunications Union (ITU). There is no cost for an orbital slot, but allocation is on a first-come, first-served basis. If an operator’s competitor files by just a day before them, then they have priority. Although the allocation of a slot does not come with an ownership right to the areas of outer space, it does grant an operator exclusive rights to the resource for the lifetime of its satellite (usually fifteen years). Typically, the operators then keep refiling for the slot and replace old satellites with new ones. So, for all practical purposes, they keep the orbital slot indefinitely.

An orbit is the curved path through which objects in space move around a planet or a star. The 1967 Treaty’s regime and customary law enshrine the principle of non-appropriation and freedom of access to orbital positions. Space Law and International Telecommunication Laws combined to protect this use against any interference. The majority of space-launched objects are satellites that are launched in Earth’s orbit (a very small part of space objects – scientific objects for space exploration – are launched into outer space beyond terrestrial orbits). It is important to precise that an orbit does not exist: satellites describe orbits by obeying the general laws of universal attraction. Depending on the launching techniques and parameters, the orbital trajectory of a satellite may vary. Sun-synchronous satellites fly over a given location constantly at the same time in local civil time: they are used for remote sensing, meteorology or the study of the atmosphere. Geostationary satellites are placed in a very high orbit; they give an impression of immobility because they remain permanently at the same vertical point of a terrestrial point (they are mainly used for telecommunications and television broadcasting).

Geosynchronous orbit (GSO) and geostationary orbit (GEO) are orbits around Earth at an altitude of 35 786 kilometres matching Earth’s sidereal rotation period. All geosynchronous and geostationary orbits have a semi-major axis of 42 164 kilometres. A geostationary orbit stays exactly above the equator, whereas a geosynchronous orbit may swing north and south to cover more of the Earth’s surface. Communications satellites and weather satellites are often placed in geostationary orbits, so that the satellite antennae (located on Earth) that communicate with them do not have to rotate to track them, but can be pointed permanently at the position in the sky where the satellites are located.

Near-Earth space is formed of different orbital layers. Terrestrial orbits are limited common resources and inherently repugnant to any appropriation: they are not property in the sense of law. Orbits and frequencies are res communis (a Latin term derived from Roman law that preceded today’s concepts of the commons and common heritage of mankind; it has relevance in international law and common law). It’s the first-come, first-served principle that applies to orbital positioning, which without any formal acquisition of sovereignty, records a promptness behaviour to which it grants an exclusive grabbing effect of the space concerned. Geostationary orbit is a limited but permanent resource: this de facto appropriation by the first-comers – the developed countries – of the orbit and the frequencies is protected by Space Law and the International Telecommunications Law. The challenge by developing countries of grabbing these resources is therefore unjustified on the basis of existing law. Denying new entrants geostationary-access or making access more difficult does not constitute appropriation; it simply results from the traditional system of distribution of access rights. The practice of developed States is based on free access and priority given to the first satellites placed in geostationary orbit.

#### 1] Precision – if we win definitions the aff doesn’t defend a shift from the squo or solve their advantages – so at best vote negative on presumption. The resolution is the only predictable stasis point for dividing ground—any deviation justifies the aff arbitrarily jettisoning words in the resolution at their whim which decks negative ground and preparation because the aff is no longer bounded by the resolution.

#### 2] Predictable limits—including satellite slots offers huge explosion in the topic since they get permutations of different satellite systems – LEO MEO and HEO, plus different companies, plus sizes of constellations, et cetera. Letting temporary occupation be appropriation is a limits diaster - any aff about a single space ship, satellite, or weapon would be T because they temporarily occupy space. Limits explodes neg prep burden and draws un-reciprocal lines of debate, where the aff is always ahead, turns their pragmatics offense

#### No RVIs—it’s your burden to be topical.

## 3

### 1nc – cp

#### States should:

#### 1)

#### Remove the most volatile and largest Debris pieces from the most congested orbits

#### Mandate UN guidelines on space debris mitigation

#### Collaborate on techniques to track and display the location of objects in real time and AI to automate debris-avoidance maneuvers

#### Indefinitely stall deployment of low earth orbit ASAT’s.

#### 2) Require asteroid observation facilities on every large satellite constellations

#### First plank solves satellites, miscalc, Kessler, and debris collisions

Nature 8/11 [(Nature Editorial Board, peer-reviewed, comprises experimental scientists and data-standards experts from across different fields of science) “The world must cooperate to avoid a catastrophic space collision,” Nature, 8/11/2021] JL

But there are no traffic cops in space, nor international borders with clearly delineated areas of responsibility. To avoid further damage, it’s crucial that satellite operators have an accurate and up-to-date list of where objects are in space. At present, the main global catalogue of space objects is published at Space-Track.org by the US Space Command, a branch of the military. The catalogue is the most widely used public listing available, but it lacks some satellites that countries — including the United States, China and Russia — have not acknowledged publicly. In part because of this lack of transparency, other nations also track space objects, and some private companies maintain commercially available catalogues.

Rather than this patchwork of incomplete sources, what the world needs is a unified system of space traffic management. Through this, spacefaring nations and companies could agree to share more of their tracking data and cooperate to make space safer. This might require the creation of a new global regime, such as an international convention, through which rules and technical standards could be organized. One analogy is the International Telecommunication Union, the United Nations agency that coordinates global telecommunications issues such as who can transmit in which parts of the radio spectrum.

It won’t be easy to create such a system for space traffic. For it to succeed, questions of safety (such as avoiding smashing up a satellite) will need to be disentangled from questions of security (such as whether that satellite is spying on another nation) so that countries can be assured that participating in such an effort would not compromise national security. Countries could, for instance, share information about the location of a satellite without sharing details of its capabilities or purpose for being in space.

One near-term move that would help would be for the United States to complete a planned shift of responsibility for the Space-Track.org catalogue from the military to the civilian Department of Commerce. Because this catalogue has historically been the most widely used around the world, shifting it to a civilian agency could start to defuse geopolitical tensions and so improve global efforts to manage space debris. It might one day feed into a global space-traffic agreement between nations; even the nascent space superpower China would have a big incentive to participate, despite rivalries with the United States. The transition was called for in a 2018 US presidential directive that recognizes that companies are taking over from national governments as the dominant players in space, but it has yet to occur, in part because Congress has not allocated the necessary funds.

On 25 August, the UN Committee on the Peaceful Uses of Outer Space will meet to discuss a range of topics related to international cooperation in space. The UN is the right forum through which spacefaring nations can work together to establish norms for responsible space behaviour, and that should include how the world can track objects to make space safer. It should continue recent work it has been doing emphasizing space as a secure and sustainable environment, which at least brings countries such as the United States and China into the same conversation.

Basic research has a role, too: innovations such as techniques to track and display the locations of orbiting objects in real time, and artificial intelligence to help automate debris-avoidance manoeuvres, could bolster any global effort to monitor and regulate space.

If governments and companies around the world do not take urgent action to work together to make space safer, they will one day face a catastrophic collision that knocks out one or more satellites key to their safety, economic well-being or both. Space is a global commons and a global resource. A global organization responsible for — and capable of — managing the flow of space traffic is long overdue.

#### Second plank solves by allowing asteroid observation which prevents sabotaging and solves asteroid threats

## 4

### 1nc – da

#### Starlink key to global internet spread – improves global economic stability, new business and skilled labor

Antin 20 – [Doug, “Why Elon Musk’s Starlink Will Change Your Life,” 7/15/2020, https://medium.com/predict/why-elon-musks-starlink-will-change-your-life-31a2f9a84f3b]

The year is 2020 and nearly 40% of the world still does not have stable access to the internet. That’s about 12 times the number of people in the entire United States of America that don’t connect to the internet. For a large number of them, the reason is that they don’t have access to the infrastructure necessary to get online. But that’s about to change with Elon Musks company SpaceX and their Starlink project.

Starlink is an ambitious project that aims to put nearly 2,000 small satellites into orbit by the end of 2021 to provide a globalized network of internet access. The ultimate goal is to get affordable internet to every part of the world. As Starlink provides access and the remaining 40% of the global population comes online, the fundamental cultural makeup of the internet will change.

If you think about it in terms of the technology adoption lifecycle, change is inevitable. A massive influx of new users joining the globalized digital network will redefine the meaning of digital life. Assuming Musk succeeds, the world will be significantly impacted by adding nearly half the world’s population to the web.

As the entire world gains access to the internet, we will see a wave of cultural change to preexisting digital communities as well as the formation of new digital ecosystems. The economic engine that is the internet will provide new forms of prosperity to billions of people and fundamentally alter the traditional power dynamics of the world.

40% of the World Doesn’t Have Internet Access

The world currently has a population of nearly 7.8 billion people. A little under half of them do not have regular internet access.

Those without access are disproportionately low income and non-English speaking regions of the world. Despite this lack of access, the data indicate that although there is limited access in these regions, there does exist an appetite for connectivity. This is showcased by a significant surge in mobile broadband use over the last few years.

So what does this mean to you, a person that already has internet?

As Starlink comes online and makes access possible for nearly 4 billion people, we can expect the fundamental makeup of the internet to change. That includes the language and cultural norms of digital communities. Here’s how it might happen.

Language Composition of the Internet Will Change

According to stats on the top 10 languages used on the internet, the English language narrowly beats out Chinese for the number one spot.

China’s domestic internet penetration rate is only around 60% compared to the US rate of 75% as of 2020. While these may not seem too different, consider that China’s population is nearly 1.5 billion people to 330 million in the US. The point being, as more Chinese come online, we can expect the top language used on the internet may shift towards Chinese.

Not sold? Consider the Chinese Government’s aggressive approach to building infrastructure in Africa which is disproportionately under-represented in internet access. As China continues to integrate with Africa, will these new internet users ultimately opt for English or Chinese as their preferred language of the internet?

These factors create an interesting paradigm for a shift in the dominant language of the web.

Digital Culture Will Change

Regardless of the predominant language of the internet, it’s clear that a cultural shift will also take place as the global population comes online. New people joining global communities from developing locations will bring considerably different worldviews.

It’s unclear how their mobile-first use of the internet will impact web traffic and technology preferences in the future.

According to the widely used SEO tool Ahrefs, these are the top 5 most popular websites by traffic around the world. (Visits per month)

youtube.com 8,564,946,8852

facebook.com 3,483,131,2643

en.wikipedia.org 2,223,668,8554

twitter.com 2,008,820,3155

amazon.com 618,747,155

These are unlikely to change positions because they are mobile-friendly and offer utility and convenience to just about everyone. But we can expect a fundamental shift in where web traffic flows based on the unique preferences of new user demographics. As web traffic changes, we can expect the advertising dollars to shift towards these new areas. Creating new opportunities and harming incumbent businesses.

New Business Opportunities Will Arise

As the internet becomes available to the second half of the world there is no doubt that massive business opportunities will proliferate. Entrepreneurs will ask questions such as what services will these new users need and seek out?

In low access regions, there is a clear deficit in IT skills. We can expect to see growth in easy to access programs for upskilling individuals as they gain internet access. Globalized versions of Khan Academy. These programs will be mobile friendly and focus on core business skills such as communications, file transfers, and other basic competencies.

There will also be an opportunity to provide training in mobile-oriented financial security and privacy tools. Proper online banking habits, understanding the threat of phishing schemes, and lessons on the importance of strong passwords.

The connection of global populations will also present interesting labor arbitrage opportunities. As more low-income regions gain access and become skilled in information technology, they alter the global labor wage dynamic. Businesses in developed countries will gain access to more affordable digital labor while simultaneously, developed world workers may experience wage disruption. Possibly even employment displacement. This is a boon for business expenditures and a potential pitfall for the labor economy as a global wage equilibrium is found.

#### Starlink makes fast internet globally accessible

Crist 22 – [Ry, CNET, “Starlink explained: Everything you should know about Elon Musk's satellite internet venture,” 1/10/2022, https://www.cnet.com/home/internet/starlink-satellite-internet-explained/]

Starlink's business is accelerating, as well. In February of 2021, Musk's company disclosed that Starlink was serving more than 10,000 customers. Now, after expanding preorders to even more potential customers, releasing a second-gen home internet satellite dish, and exploring the possibility of providing in-flight Wi-Fi for passenger aircraft, Musk says that Starlink has shipped more than 100,000 satellite internet terminals to customers in 14 countries.

During a talk at Mobile World Congress in June 2021, Musk told an audience that Starlink would be available worldwide except at the North and South Poles starting in August, though regional availability will depend on regulatory approval. In September, Musk tweeted that Starlink would exit its initial beta phase in October, which indicates that the service is continuing to ramp up and expand -- though the budding broadband provider faces a backlog of prospective customers waiting to receive equipment and start service.

Starlink isn't without its controversies. Members of the scientific community have raised concerns about the impact of Starlink's low-earth orbit satellites on night sky visibility. Meanwhile, satellite internet competitors including Viasat, HughesNet and Amazon's Project Kuiper have taken notice of Starlink's momentum, too, prompting plenty of regulatory jousting and attempts to slow Musk down.

We'll continue to monitor Starlink's progress in 2022. For now, here's everything you should know about it.

OK, start at the beginning: What is Starlink, exactly?

Technically a division within SpaceX, Starlink is also the name of the spaceflight company's growing network -- or "constellation" -- of orbital satellites. The development of that network began in 2015, with the first prototype satellites launched into orbit in 2018.

In the years since, SpaceX has deployed nearly 2,000 Starlink satellites into orbit across dozens of successful launches, the most recent of which took place on Jan. 6 and delivered another 49 satellites into orbit. That brings the total number of satellites in the constellation up to 1,993, though some of those satellites are prototypes or nonoperational units that aren't functioning parts of the network.

And those satellites can connect my home to the internet?

That's the idea, yes.

Just like existing providers of satellite internet like HughesNet or Viasat, Starlink wants to sell internet access -- particularly to people in rural areas and other parts of the world who don't already have access to high-speed broadband.

"Starlink is ideally suited for areas of the globe where connectivity has typically been a challenge," the Starlink website reads. "Unbounded by traditional ground infrastructure, Starlink can deliver high-speed broadband internet to locations where access has been unreliable or completely unavailable."

#### Internet access global dampener on existential risk

David **Eagleman 10**, Neuroscientist at Baylor College of Medicine, where he directs the Laboratory for Perception and Action and the Initiative on Neuroscience and Law and author of Sum (Canongate). Nov. 9, “Six ways the internet will save civilization,” http://www.wired.co.uk/magazine/archive/2010/12/start/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.

## 5

### 1nc – k

#### Settler colonialism is the permeating structure of the nation-state which requires the elimination of indigenous life and land via the occupation of settlers. The appropriation of land turns Natives into ghosts and chattel slaves into excess labor.

Tuck and Yang 12

(Eve Tuck, Unangax, State University of New York at New Paltz K. Wayne Yang University of California, San Diego, Decolonization is not a metaphor, Decolonization: Indigeneity, Education & Society Vol. 1, No. 1, 2012, pp. 1-40, JKS)

Our intention in this descriptive exercise is not be exhaustive, or even inarguable; instead, we wish to emphasize that (a) decolonization will take a different shape in each of these contexts - though they can overlap - and that (b) neither external nor internal colonialism adequately describe the form of colonialism which operates in the United States or other nation-states in which the colonizer comes to stay. Settler colonialism operates through internal/external colonial modes simultaneously because there is no spatial separation between metropole and colony. For example, in the United States, many Indigenous peoples have been forcibly removed from their homelands onto reservations, indentured, and abducted into state custody, signaling the form of colonization as simultaneously internal (via boarding schools and other biopolitical modes of control) and external (via uranium mining on Indigenous land in the US Southwest and oil extraction on Indigenous land in Alaska) with a frontier (the US military still nicknames all enemy territory “Indian Country”). The horizons of the settler colonial nation-state are total and require a mode of total appropriation of Indigenous life and land, rather than the selective expropriation of profit-producing fragments. Settler colonialism is different from other forms of colonialism in that settlers come with the intention of making a new home on the land, a homemaking that insists on settler sovereignty over all things in their new domain. Thus, relying solely on postcolonial literatures or theories of coloniality that ignore settler colonialism will not help to envision the shape that decolonization must take in settler colonial contexts. Within settler colonialism, the most important concern is land/water/air/subterranean earth (land, for shorthand, in this article.) Land is what is most valuable, contested, required. This is both because the settlers make Indigenous land their new home and source of capital, and also because the disruption of Indigenous relationships to land represents a profound epistemic, ontological, cosmological violence. This violence is not temporally contained in the arrival of the settler but is reasserted each day of occupation. This is why Patrick Wolfe (1999) emphasizes that settler colonialism is a structure and not an event. In the process of settler colonialism, land is remade into property and human relationships to land are restricted to the relationship of the owner to his property. Epistemological, ontological, and cosmological relationships to land are interred, indeed made pre-modern and backward. Made savage. In order for the settlers to make a place their home, they must destroy and disappear the Indigenous peoples that live there. Indigenous peoples are those who have creation stories, not colonization stories, about how we/they came to be in a particular place - indeed how we/they came to be a place. Our/their relationships to land comprise our/their epistemologies, ontologies, and cosmologies. For the settlers, Indigenous peoples are in the way and, in the destruction of Indigenous peoples, Indigenous communities, and over time and through law and policy, Indigenous peoples’ claims to land under settler regimes, land is recast as property and as a resource. Indigenous peoples must be erased, must be made into ghosts (Tuck and Ree, forthcoming). At the same time, settler colonialism involves the subjugation and forced labor of chattel slaves, whose bodies and lives become the property, and who are kept landless. Slavery in settler colonial contexts is distinct from other forms of indenture whereby excess labor is extracted from persons. First, chattels are commodities of labor and therefore it is the slave’s person that is the excess. Second, unlike workers who may aspire to own land, the slave’s very presence on the land is already an excess that must be dis-located. Thus, the slave is a desirable commodity but the person underneath is imprisonable, punishable, and murderable. The violence of keeping/killing the chattel slave makes them deathlike monsters in the settler imagination; they are reconfigured/disfigured as the threat, the razor’s edge of safety and terror. The settler, if known by his actions and how he justifies them, sees himself as holding dominion over the earth and its flora and fauna, as the anthropocentric normal, and as more developed, more human, more deserving than other groups or species. The settler is making a new "home" and that home is rooted in a homesteading worldview where the wild land and wild people were made for his benefit. He can only make his identity as a settler by making the land produce, and produce excessively, because "civilization" is defined as production in excess of the "natural" world (i.e. in excess of the sustainable production already present in the Indigenous world). In order for excess production, he needs excess labor, which he cannot provide himself. The chattel slave serves as that excess labor, labor that can never be paid because payment would have to be in the form of property (land). The settler's wealth is land, or a fungible version of it, and so payment for labor is impossible.6 The settler positions himself as both superior and normal; the settler is natural, whereas the Indigenous inhabitant and the chattel slave are unnatural, even supernatural. Settlers are not immigrants. Immigrants are beholden to the Indigenous laws and epistemologies of the lands they migrate to. Settlers become the law, supplanting Indigenous laws and epistemologies. Therefore, settler nations are not immigrant nations (See also A.J. Barker, 2009). Not unique, the United States, as a settler colonial nation-state, also operates as an empire - utilizing external forms and internal forms of colonization simultaneous to the settler colonial project. This means, and this is perplexing to some, that dispossessed people are brought onto seized Indigenous land through other colonial projects. Other colonial projects include enslavement, as discussed, but also military recruitment, low-wage and high-wage labor recruitment (such as agricultural workers and overseas-trained engineers), and displacement/migration (such as the coerced immigration from nations torn by U.S. wars or devastated by U.S. economic policy). In this set of settler colonial relations, colonial subjects who are displaced by external colonialism, as well as racialized and minoritized by internal colonialism, still occupy and settle stolen Indigenous land. Settlers are diverse, not just of white European descent, and include people of color, even from other colonial contexts. This tightly wound set of conditions and racialized, globalized relations exponentially complicates what is meant by decolonization, and by solidarity, against settler colonial forces. Decolonization in exploitative colonial situations could involve the seizing of imperial wealth by the postcolonial subject. In settler colonial situations, seizing imperial wealth is inextricably tied to settlement and re-invasion. Likewise, the promise of integration and civil rights is predicated on securing a share of a settler-appropriated wealth (as well as expropriated ‘third-world’ wealth). Decolonization in a settler context is fraught because empire, settlement, and internal colony have no spatial separation. Each of these features of settler colonialism in the US context - empire, settlement, and internal colony - make it a site of contradictory decolonial desires7. Decolonization as metaphor allows people to equivocate these contradictory decolonial desires because it turns decolonization into an empty signifier to be filled by any track towards liberation. In reality, the tracks walk all over land/people in settler contexts. Though the details are not fixed or agreed upon, in our view, decolonization in the settler colonial context must involve the repatriation of land simultaneous to the recognition of how land and relations to land have always already been differently understood and enacted; that is, all of the land, and not just symbolically. This is precisely why decolonization is necessarily unsettling, especially across lines of solidarity. “Decolonization never takes place unnoticed” (Fanon, 1963, p. 36). Settler colonialism and its decolonization implicates and unsettles everyone.

#### Extinction impacts are fabricated by the settler death drive - settlers have a psychological investment in imagining the end of the world to create a sense of white vulnerability at the expense of enacting decolonization.

Dalley 16

(Hamish Dalley received his Ph.D. from the Australian National University in 2013, and is now an Assistant Professor of English at Daemen College, Amherst, New York, where he is responsible for teaching in World and Postcolonial Literatures., (2016): The deaths of settler colonialism: extinction as a metaphor of decolonization in contemporary settler literature, Settler Colonial Studies, DOI: 10.1080/2201473X.2016.1238160, JKS)

Settlers love to contemplate the possibility of their own extinction; to read many contemporary literary representations of settler colonialism is to find settlers strangely satisfied in dreaming of ends that never come. This tendency is widely prevalent in English-language representations of settler colonialism produced since the 1980s: the possibility of an ending – the likelihood that the settler race will one day die out – is a common theme in literary and pop culture considerations of colonialism’s future. Yet it has barely been remarked how surprising it is that this theme is so present. For settlers, of all people, to obsessively ruminate on their own finitude is counterintuitive, for few modern social formations have been more resistant to change than settler colonialism. With a few excep- tions (French Algeria being the largest), the settler societies established in the last 300 years in the Americas, Australasia, and Southern Africa have all retained the basic features that define them as settler states – namely, the structural privileging of settlers at the expense of indigenous peoples, and the normalization of whiteness as the marker of pol- itical agency and rights – and they have done so notwithstanding the sustained resistance¶ that has been mounted whenever such an order has been built. Settlers think all the time that they might one day end, even though (perhaps because) that ending seems unlikely ever to happen. The significance of this paradox for settler-colonial literature is the subject of this article.¶ Considering the problem of futurity offers a useful foil to traditional analyses of settler- colonial narrative, which typically examine settlers’ attitudes towards history in order to highlight a constitutive anxiety about the past – about origins. Settler colonialism, the argument goes, has a problem with historical narration that arises from a contradiction in its founding mythology. In Stephen Turner’s formulation, the settler subject is by definition one who comes from elsewhere but who strives to make this place home. The settlement narrative must explain how this gap – which is at once geographical, historical, and existential – has been bridged, and the settler transformed from outsider into indigene. Yet the transformation must remain constitutively incomplete, because the desire to be at home necessarily invokes the spectre of the native, whose existence (which cannot be disavowed completely because it is needed to define the settler’s difference, superior- ity, and hence claim to the land) inscribes the settler’s foreignness, thus reinstating the gap between settler and colony that the narrative was meant to efface.1 Settler-colonial narrative is thus shaped around its need to erase and evoke the native, to make the indigene both invisible and present in a contradictory pattern that prevents settlers from ever moving on from the moment of colonization.2 As evidence of this constitutive contradiction, critics have identified in settler-colonial discourse symptoms of psychic distress such as disavowal, inversion, and repression.3 Indeed, the frozen temporality of settler-colonial narrative, fixated on the moment of the frontier, recalls nothing so much as Freud’s description of the ‘repetition compulsion’ attending trauma.4 As Lorenzo Veracini puts it, because:¶ ‘settler society’ can thus be seen as a fantasy where a perception of a constant struggle is juxtaposed against an ideal of ‘peace’ that can never be reached, settler projects embrace and reject violence at the same time. The settler colonial situation is thus a circumstance where the tension between contradictory impulses produces long-lasting psychic conflicts and a number of associated psychopathologies.5¶ Current scholarship has thus focused primarily on settler-colonial narrative’s view of the past, asking how such a contradictory and troubled relationship to history might affect present-day ideological formations. Critics have rarely considered what such narratological tensions might produce when the settler gaze is turned to the future. Few social formations are more stubbornly resistant to change than settlement, suggesting that a future beyond settler colonialism might be simply unthinkable. Veracini, indeed, suggests that settler-colonial narrative can never contemplate an ending: that settler decolonization is inconceivable because settlers lack the metaphorical tools to imagine their own demise.6 This article outlines why I partly disagree with that view. I argue that the narratological paradox that defines settler-colonial narrative does make the future a problematic object of contemplation. But that does not make settler decolonization unthinkable per se; as I will show, settlers do often try to imagine their demise – but they do so in a way that reasserts the paradoxes of their founding ideology, with the result that the radical potentiality of decolonization is undone even as it is invoked.¶ I argue that, notwithstanding Veracini’s analysis, there is a metaphor via which the end of settler colonialism unspools – the quasi-biological concept of extinction, which, when deployed as a narrative trope, offers settlers a chance to consider and disavow their demise, just as they consider and then disavow the violence of their origins. This article traces the importance of the trope of extinction for contemporary settler-colonial litera- ture, with a focus on South Africa, Canada, and Australia. It explores variations in how the death of settler colonialism is conceptualized, drawing a distinction between his- torio-civilizational narratives of the rise and fall of empires, and a species-oriented notion of extinction that draws force from public anxiety about climate change – an invocation that adds another level of ambivalence by drawing on ‘rational’ fears for the future (because climate change may well render the planet uninhabitable to humans) in order to narrativize a form of social death that, strictly speaking, belongs to a different order of knowledge altogether. As such, my analysis is intended to draw the attention of settler- colonial studies toward futurity and the ambivalence of settler paranoia, while highlighting a potential point of cross-fertilization between settler-colonial and eco-critical approaches to contemporary literature.¶ That ‘extinction’ should be a key word in the settler-colonial lexicon is no surprise. In Patrick Wolfe’s phrase,7 settler colonialism is predicated on a ‘logic of elimination’ that tends towards the extermination – by one means or another – of indigenous peoples.8 This logic is apparent in archetypal settler narratives like James Fenimore Cooper’s The Last of the Mohicans (1826), a historical novel whose very title blends the melancholia and triumph that demarcate settlers’ affective responses to the supposed inevitability of indigenous extinction. Concepts like ‘stadial development’ – by which societies progress through stages, progressively eliminating earlier social forms – and ‘fatal impact’ – which names the biological inevitability of strong peoples supplanting weak – all contribute to the notion that settler colonialism is a kind of ‘ecological process’ that necessitates the extinction of inferior races. What is surprising, though, is how often the trope of extinction also appears with reference to settlers themselves; it makes sense for settlers to narrate how their presence entails others’ destruction, but it is less clear why their attempts to imagine futures should presume extinction to be their own logical end as well.¶ The idea appears repeatedly in English-language literary treatments of settler colonial- ism. Consider, for instance, the following rumination on the future of South African settler society, from Olive Schreiner’s 1883 Story of an African Farm:¶ It was one of them, one of those wild old Bushmen, that painted those pictures there. He did not know why he painted but he wanted to make something, so he made these. [...] Now the Boers have shot them all, so that we never see a yellow face peeping out among the stones. [...] And the wild bucks have gone, and those days, and we are here. But we will be gone soon, and only the stones will lie on, looking at everything like they look now.10¶ In this example, the narrating settler character, Waldo, recognizes prior indigenous inha- bitation but his knowledge comes freighted with an expected sense of biological super- iority, made apparent by his description of the ‘Bushman’s’ ‘yellow face’, and lack of mental self-awareness. What is not clear is why Waldo’s contemplation of colonial geno- cide should turn immediately to the assumption that a similar fate awaits his people as well. A similar presumption of racial vulnerability permeates other late nineteenth- century novels from the imperial metropole, such as Dracula and War of the Worlds,¶ which are plotted around the prospect of invasions that would see the extinction of British imperialism, and, in the process, the human species.¶ Such anxieties draw energy from a pattern of settler defensiveness that can be observed across numerous settler-colonial contexts. Marilyn Lake’s and Henry Reynold’s account of the emergence of transnational ‘whiteness’ highlights the paradoxical fact that while white male settlers have been arguably the most privileged class in history, they have routinely perceived themselves to be ‘under siege’, threatened with destruction to the extent that their very identity of ‘whiteness was born in the apprehension of immi- nent loss’.11 The fear of looming annihilation serves a powerful ideological function in settler communities, working to foster racial solidarity, suppress dissent, and legitimate violence against indigenous populations who, by any objective measure, are far more at risk of extermination than the settlers who fear them. Ann Curthoys and Dirk Moses have traced this pattern in Australia and Israel-Palestine, respectively.12 This scholarship suggests that narratives of settler extinction are acts of ideological mystification, obscuring the brutal inequalities of the frontier behind a mask of white vulnerability – an argument with which I sympathize. However, this article shows how there is more to settler-colonial extinction narratives than bad faith. I argue that we need a more nuanced understanding of how they encode a specifically settler-colonial framework for imagining the future, one that has implications for how we understand contemporary literatures from settler societies, and which allows us to see extinction as a genuine, if flawed, attempt to envisage social change.¶ In the remainder of this paper I consider extinction’s function as a metaphor of decolonization. I use this phrase to invoke, without completely endorsing, Tuck and Yang’s argu- ment that to treat decolonization figuratively, as I argue extinction narratives do, is necessarily to preclude radical change, creating opportunities for settler ‘moves to innocence’ that re-legitimate racial inequality.13 The counterview to this pessimistic perspec- tive is offered by Veracini, who suggests that progressive change to settler-colonial relationships will only happen if narratives can be found that make decolonization think- able.14 This article enters the debate between these two perspectives by asking what it means for settler writers to imagine the future via the trope of extinction. Does extinction offer a meaningful way to think about ending settler colonialism, or does it re-activate settler-colonial patterns of thought that allow exclusionary social structures to persist?¶ I explore this question with reference to examples of contemporary literary treatments of extinction from select English-speaking settler-colonial contexts: South Africa, Australia, and Canada.15 The next section of this article traces key elements of extinction narrative in a range of settler-colonial texts, while the section that follows offers a detailed reading of one of the best examples of a sustained literary exploration of human finitude, Margaret Atwood’s Maddaddam trilogy (2003–2013). I advance four specific arguments. First, extinc- tion narratives take at least two forms depending on whether the ‘end’ of settler society is framed primarily in historical-civilizational terms or in a stronger, biological sense; the key question is whether the ‘thing’ that is going extinct is a society or a species. Second, biologically oriented extinction narratives rely on a more or less conscious slippage between ‘the settler’ and ‘the human’. Third, this slippage is ideologically ambivalent: on the one hand, it contains a radical charge that invokes environmentalist discourse and climate-change anxiety to imagine social forms that re-write settler-colonial dynamics; on the other, it replicates a core aspect of imperialist ideology by normalizing whiteness as¶ equivalent to humanity. Fourth, these ideological effects are mediated by gender, insofar as extinction narratives invoke issues of biological reproduction, community protection, and violence that function to differentiate and reify masculine and feminine roles in the putative de-colonial future. Overall, my central claim is that extinction is a core trope through which settler futurity emerges, one with crucial narrative and ideological effects that shape much of the contemporary literature emerging from white colonial settings.

#### This understanding of “space” replicates a Western theorization of place as neutral space relegates indigenous peoples to colonial authority by creating “cultural blanks” to be filled in by peaceful settlement

Barker and Pickerill 12 (Adam J Barker, and Jenny Pickerill, Department of Geography @ Univ of Leicester. “Radicalizing Relationships To and Through Shared Geographies: Why Anarchists Need to Understand Indigenous Connections to Lands and Place” Antipode.

Colonial Impacts on Perceptions of Place Indigenous understandings of place have generated criticism of many aspects of society in the northern bloc: Christian theology’s influence on political and economic colonial practice (Deloria 2003); the concept of “sovereignty” and the state system (Alfred 2006); constitutionalism as a method of governmental organization (Tully 1995; 2000); capitalism and relationships under a capitalist system (Adams 1989:17); language and culture (Basso 1996) and many other understandings of place, space, nature, and human relationships. Indigenous relationships to place fundamentally challenge colonial spatial concepts, from the ways that we move from place to place and through spaces (Pandya 1990) to how we move through time (Jojola 2004). Indeed Coulthard (2010:79) asserts that for Indigenous people place is central to understandings of life, whereas “most Western societies . . . derive meaning from the world in historical/developmental terms, thereby placing time as the narrative of central importance”. Historically, EuroAmerican cultures conceived of human relations to the environment in one of two ways, which John Rennie Short labels the “classical and romantic” (Short 1991:6): either “natural” places are improved through development and human spatial creation and use (with “wilderness” as a frightening, exterior “ other”), or despoiled through human contact and change (with the natural environment as a pristine and perfect spatial concept, and the suggestion that human identity must be bounded within it). Both conceptually marginalize or fully erase Indigenous presence in place. Contra this erasure, Indigenous peoples’ understandings of place have become important to the understanding of colonial geographies and the efforts of anti-colonial activists.2 Indigenous peoples have traditionally related to place through spatially stretched and dynamic networks of relationships (Cajete 2004; Johnson and Murton 2007). These networks bear some resemblance to Sarah Whatmore’s concept of hybrid geography, “which recognizes agency as a relational achievement, involving the creative presence of organic beings, technological devices and discursive codes, as well as people, in the fabrics of everyday living” (Whatmore 1999:26). Through these, Indigenous peoples have challenged the classical/romantic dichotomy that continues to haunt some aspects of anarchist spatial perceptions. For Indigenous peoples, place holistically encapsulates networks of relations between humans, features of the land, non-human animals, and living beings perceived as spirits or non-physical entities. All of these—humans included— are understood to have autonomy and will, but also obligation and responsibility to all of the other elements to which they are related and among whom they are situated. As such, we acknowledge that land and place are different to each other but seek to use the way they are interrelated throughout this article. Although land can be considered as material, its meaning is constantly interwoven into the relationality of place so that land is often taken to have multiple meanings beyond its simple materiality—as a resource, as identity and as relationship (Coulthard 2010). Indigenous peoples assaulted by settler colonization have and continue to face concerted attempts to break Indigenous connections to place. Religious conversion, for example, has had a massive impact on the ways that Indigenous peoples perceive the spaces occupied by spirit and otherwise metaphysical beings. Though no longer considered “tantamount to a complete transformation of cultural identity” (Axtell 1981:42), conversion to and participation in hierarchical-organized, spatially dislocated, and temporally defined Judeo-Christian religions (Deloria 2003:62–77) encouraged Indigenous peoples to see the spiritual as something above (literally) and beyond the direct contact of the human world. The general result is displacement and dislocation.

#### Thus, the only alternative is decolonization. The judge ought to prioritize centering indigenous resistance – any ethical commitment requires that the aff places itself in the center of native scholarship and demands.

Tuck and Yang 12

(Eve Tuck, Unangax, State University of New York at New Paltz K. Wayne Yang University of California, San Diego, Decolonization is not a metaphor, Decolonization: Indigeneity, Education & Society Vol. 1, No. 1, 2012, pp. 1-40, JKS)

An ethic of incommensurability, which guides moves that unsettle innocence, stands in contrast to aims of reconciliation, which motivate settler moves to innocence. Reconciliation is about rescuing settler normalcy, about rescuing a settler future. Reconciliation is concerned with questions of what will decolonization look like? What will happen after abolition? What will be the consequences of decolonization for the settler? Incommensurability acknowledges that these questions need not, and perhaps cannot, be answered in order for decolonization to exist as a framework. We want to say, first, that decolonization is not obliged to answer those questions - decolonization is not accountable to settlers, or settler futurity. Decolonization is accountable to Indigenous sovereignty and futurity. Still, we acknowledge the questions of those wary participants in Occupy Oakland and other settlers who want to know what decolonization will require of them. The answers are not fully in view and can’t be as long as decolonization remains punctuated by metaphor. The answers will not emerge from friendly understanding, and indeed require a dangerous understanding of uncommonality that un-coalesces coalition politics - moves that may feel very unfriendly. But we will find out the answers as we get there, “in the exact measure that we can discern the movements which give [decolonization] historical form and content” (Fanon, 1963, p. 36). To fully enact an ethic of incommensurability means relinquishing settler futurity, abandoning the hope that settlers may one day be commensurable to Native peoples. It means removing the asterisks, periods, commas, apostrophes, the whereas’s, buts, and conditional clauses that punctuate decolonization and underwrite settler innocence. The Native futures, the lives to be lived once the settler nation is gone - these are the unwritten possibilities made possible by an ethic of incommensurability.*when you take away the punctuation he says of lines lifted from the documents about military-occupied land its acreage and location you take away its finality opening the possibility of other futures* -Craig Santos Perez, Chamoru scholar and poet (as quoted by Voeltz, 2012)

Decolonization offers a different perspective to human and civil rights based approaches to justice, an unsettling one, rather than a complementary one. Decolonization is not an “and”. It is an elsewhere.

#### Our interpretation is that the judge ought to evaluate the 1ac as a research project – they don’t get to weigh the case

#### 1. Plan focus restricts the debate to a ten second statement and leaves the rest of the aff unquestioned. They should be responsible for the way their knowledge is constructed and used because that produces the best model for activism and ethics in the context of their aff

#### 2. The K is a prior question – it informs the value of the game – if we win debate trains students to be violent outside of their rounds, that should come first

#### 3. Performance DA – you’re an educator responsible for judging the behavior and scholarly production of the aff – that means you should TKO them if we win a link

## Case

### Framing

#### 1. Every piece of impact defense to the aff is a justification for why you should reduce the aff’s risk down to infitismely small – proves that their scenarios are fabricated for settlerism

#### 2. D/b – either you only die once so it’s painless or timeframe means you reduce their impacts down to a negligible amount and our ontological claims means settlerism ow/s either way

### Solvency

#### Aff doesn’t solve – all of the really destructive mining projects are the ones with super high economic benefits – tiny projects with little benefit would get stopped but SpaceX stuff like starlink with huge economic ramifications would still happen

### Small rocks ☺ (debris lol)

#### Squo solves debris – private tracking, surveillance, in-orbit servicing and green satellite tech all happening now – includes constellations

CSTP 20 – OECD Committee, The strategic objectives of the Committee as defined in its Mandate and by the work priorities agreed by Member countries' Ministers responsible for science and technology provide the framework for the Secretariat's proposals for activities to be developed or initiated under the aegis of the Committee itself or its subsidiary bodies (NESTI, TIP, GSF, BNCT and IPSO) [This paper was approved and declassified by written procedure by the Committee for Scientific and Technological Policy (CSTP) on 11 March 2020 and prepared for publication by the OECD Secretariat, “SPACE SUSTAINABILITYTHE ECONOMICS OF SPACE DEBRIS IN PERSPECTIVE,” OECD Science, Technology and Industry Policy Papers, April 2020, No. 87, https://www.oecd-ilibrary.org/science-and-technology/space-sustainability\_a339de43-en]

An emerging “space debris economy”?

* Will we see a more intensive use of cubesats and miniaturised technologies in lower orbits? Cubesats have been the fastest-growing category of launched satellites in the last years and, when launched at lower altitudes, are naturally compliant with debris mitigation guidelines. They are also ever more performant and affordable, and dedicated launch opportunities become more widespread. Furthermore, they increasingly receive preferential treatment in risk-based national legislations (e.g. introduction of sliding scale in the UK Outer Space Act for insurance requirements).
* Space surveillance and tracking capabilities, in both GEO and LEO: New (private) sources of situational awareness data are becoming increasingly important, with data analytics and modelling fuelled by advances in digital technologies. Private sector debris catalogues and tracking capabilities for the geostationary orbit may now be almost as good as government capabilities (IDA, 2016[76]), while solutions for the low-earth orbit are emerging. Start-ups such as LeoLabs provide data and services based on low-cost ground equipment and sophisticated data analysis. The company, which in October 2019 had three radars in the United States and New Zealand, has developed a cloud-based “Space Regulatory and Sustainability Platform” for the New Zealand Space Agency, a first of its kind, destined to track objects launched from New Zealand to ensure compliance with permit conditions (MBIE, 2019[77]). A novel project called TruSat intends to use blockchain technology to crowdsource and validate satellite orbital positions worldwide via open source software (TruSat, 2019[78]). The US Air Force Research Laboratory has signed agreements with several commercial space situational awareness data providers (e.g. Numerica, LeoLabs, ExoAnalytics) to get access to sensor networks and algorithms (Numerica, 2019[79]). The Space Situational Awareness (SSA) open-architecture data-sharing platform under development by the US Department of Commerce, including data from different government agencies, is also expected to spur innovative value-added products and services.
* In-orbit servicing solutions: Several governmental agencies and commercial companies have developed, or are in the process of acquiring, some capabilities for in-orbit servicing (e.g. NASA, DARPA, ESA, JAXA). In-orbit servicing involves a number of complex operations in space: the servicing of space platforms (e.g. satellite, space station) to replenish consumables and degradables (e.g. propellants, batteries, solar array); replacing failed functionality; and/or enhancing the mission through software and hardware upgrades. This is a major challenge as, when on orbit, space platforms can move at speeds of several kilometres a minute. The first commercial in-orbit servicing mission was launched in 2019, by a MEV-1 spacecraft developed by Orbital ATK for an Intelsat geostationary satellite. The main short-term market is seen in the life extension of geostationary satellites, with some 300 potential candidates, at least in theory (Kennedy, 2018[80]). However, the key benefits of in-orbit servicing are expected in the future. Satellite design is currently heavily restricted by extreme launch conditions, but the possibility of servicing could enable a much more flexible and modular satellite design, able to take advantage of the latest advances in materials and electronics, beyond software upgrades (Jaffart, 2018[81]). Market forecasts estimate a USD 3 billion market for in-orbit servicing over the 2017-27 period, mainly driven by life extension services (Northern Sky Research, 2018[82]).
* Active debris removal solutions: Active debris removal is at a less mature technological level, but several firms are preparing demonstration missions (e.g. Astroscale in 2020). Potential candidates for removal include more than 200 critical debris objects (3-9 tonnes); mainly rocket bodies, but also the European Envisat satellite. JAXA, has formally launched a project to remove a large piece of debris by 2025 (a Japanese rocket body) in a public-private partnership (Japanese Delegation to UNCOPUOS, 2019[83]). Both Airbus and Thales Alenia Space are developing in-orbit servicing vehicles with debris removal functions, some of which have been tested on the RemoveDEBRIS mission (Surrey Space Centre, 2019[84]; OECD, 2019[11]).

#### Space system disruptions are inevitable

Black, 18—senior analyst with Rand Europe (James, “Our reliance on space tech means we should prepare for the worst,” <https://www.defensenews.com/space/2018/03/12/our-reliance-on-space-tech-means-we-should-prepare-for-the-worst/>, dml)

Similarly worrying are the limits of organizational and societal preparedness to deal with the aftermath of a major disruption of essential space-dependent services. Governments warn that such disruption is becoming increasingly likely in the face of new threats and challenges.

Satellite systems are increasingly threatened by hostile state and nonstate actors, including through dazzling, jamming, kinetic impacts and cyber means. The European Commission has also warned that ground control stations are often vulnerable to terrorists or cyberattacks. However, perhaps the greatest fear is that any attack could provoke a chain reaction of collisions that renders entire orbits useless, known as the Kessler syndrome.

Faced with this growing panoply of risks to space infrastructure, a concerted response is needed to boost the resilience of global society to natural or man-made disruption of space-dependent services. Many of the protective measures apply to both, even if threats posed by solar flares cannot be deterred or negotiated away. In 2012, Multinational Experiment 7 united 17 nations, various civilian agencies and NATO in calls for a holistic framework to managing potential space confrontation: dissuading aggression before, defending satellites during and maximizing the resilience of both space systems to recover after an attack.

#### Low-level debris collisions now are key to infrastructure resilience—otherwise critical systems are decked by 2050

Mureșan and Georgescu, 15—currently leads the EURISC Foundation, served as senior adviser to the Romanian prime minister, the government and the minister of interior AND Research Fellow with the EURISC Foundation (Liviu and Alexandru, “The Road to Resilience in 2050,” The RUSI Journal, Volume 160, 2015 - Issue 6, dml)

By extrapolating these trends to 2050, mindful of potential technological breakthroughs, it is possible to paint a picture of how space systems will both add to and detract from the goal of ensuring societal resilience. By that point, every country developed to at least the economic and technological level of the developed world in the early twentyfirst century will have become critically dependent on space systems, especially for emerging countries which have leapfrogged over technological stages to directly use space services. Countries will be richer and safer from a host of potential disasters and disruptions through ubiquitous surveillance, information gathering and co-ordination at an accessible price through space systems.

However, the benefits of space systems can only accrue through a rate of adoption that engenders a critical dependence. By 2050, the world will be at the height of its vulnerability to space debris and space-weather phenomena. When it comes to deliberate threats, there will be a cautious détente between spacefaring nations maintained by crosscutting issues of dependence, if not on the same systems, then at least on the health and safety of the ‘global commons in space’. Due to the development and propagation of cost-effective technologies with anti-satellite applicability masked by legitimate uses, this will also be a time of opportunity for non-state actors looking to disrupt world affairs to target space systems and commit a ‘victimless’ crime. It is arguable that space systems will themselves have become more resilient – even to deliberate threats, especially of the kind accessible to non-state actors (cybernetics, jamming and so forth) – but security actors must also take into account the financial and market impact of temporary disruptions, based on the psychological effects of prevailing uncertainty, which are beyond the security decision-makers’ ability to affect.

The main barrier to a world that is more resilient in many more respects than today is the task of creating a global governance framework underpinned by real powers to regulate space activity in a way that increases resilience. The current framework, based on voluntary associations between space agencies and other actors, as well as the voluntary adoption of technical standards without power and authority to penalise actors who deviate from these norms, is woefully inadequate. The UN’s Committee on the Peaceful Uses of Outer Space has been developing such technical standards, but with little power of enforcement.33 Different treaties are supported by a mosaic of states, which are at various stages of adopting them, while other treaties lack the support of the most powerful space players, who are holding out for a framework that is to their specific advantage34 (as happened, for instance, with the failed Space Asset Protocol proposed by Unidroit, a private institution dedicated to harmonising commercial law35). Organisations such as the International Telecommunication Union, which regulates and assigns communication frequency bands to avoid ‘frequency fratricide’ between nearby satellites (which can also potentially be used as an ASAT weapon), show that the ‘orbital commons’ can be adequately regulated.36

Looking to the future, a global governance framework conducive to such resilience should: regulate the production and disposal of new space debris; regulate oversaturated orbital bands, preferably through market mechanisms; incentivise the development and application of methods for clearing up orbital debris; promote the adoption of resilient satellite design, taking advantage of new technologies and lower costs of launch (for shielding) to increase lifespan and decrease failures, as well as ensure the greatest possible interoperability; develop a multi-stakeholder model of governance, focused especially on co-opting private actors (who will own the bulk of future satellites) in a securityconscious process while addressing their needs for an environment more conducive to commercial exploitation. Such discussions should also incorporate non-spacefaring states, which must nevertheless take space security into account when devising critical infrastructure protection strategies and activities. This is especially important since, in an interconnected world, one weak link also undermines other countries through cascading disruption, even though they might have considered themselves to be adequately protected from threats. A key part of this will be a comprehensive effort at disseminating knowledge, best practices, and critical technologies and standards, while co-opting as many members as possible into arrangements such as early-warning networks and rapid-intervention initiatives. Last, but certainly not least, a focus on terrestrial infrastructure will also be essential, particularly in hardening it against threats such as space-weather phenomena – this involves not only investments and upgrades on the ground, but the use of space systems for the provision of early warning and further research into the patterns, causes and even warning signs of such phenomena.

In the end, space systems are a critical tool in negotiating the often conflicted relationship between economic development and security concerns. Their use helps to achieve a greater measure of resilience against certain kinds of disasters (such as weather patterns more extreme than ever before), but at the cost of exposure to new threats. By 2050, they will not only be integrated into existing and future critical-infrastructure protection frameworks at national, European and global levels, but they will have also gone through a number of challenges that will have strengthened resilience. Experts studying the various cases of low-intensity space-weather phenomena that have, nonetheless, caused damage have remarked on their utility as stress tests of existing infrastructure, highlighting the need to address the exposed weaknesses. As a result, the various examples of space system disruption and destruction so far have been a positive incentive for security-conscious development. This relates to the concept of ‘anti-fragility’, 37 where repeated low-level crises actually strengthen a system against a major threat which could have otherwise destroyed the system entirely. The philosophy is now being applied to critical-infrastructure protection and to space-security issues.

By 2050, the effects of past incidents will have already spawned a more resilient society, but it will have become obvious that the road to resilience extends much further into the future, as long as societies continue to develop and avoid stagnation. Resilience, in this respect, is not a destination for security experts and decision-makers, but rather a continual journey.

### Big rocks ☺ (asteroids)

#### No extinction-size asteroids on collision courses with Earth

David 18 [Jason, digital editor for The Planetary Society, NASA Space Grant graduate fellow “New report explores threat from near-Earth asteroids”, June 20 2018, http://www.planetary.org/blogs/jason-davis/2018/20180620-new-neo-threat.html]

The report's best news is that when it comes to giant asteroids like the 10-kilometer-wide object that killed the dinosaurs, we don't have to be too concerned.

"NASA is confident that it has discovered and cataloged all near-Earth asteroids large enough to cause significant global damage and determined that they are not on collision courses with Earth," the report says, while noting that this does not necessarily include faint comets on the outer reaches of the solar system. (The report does not address the odds of such a comet impacting Earth.) NASA officials also said today they believe they have found 95 percent of near-Earth asteroids more than a kilometer wide.

#### No warrant for why public entieties cant take over which means that companies wont solve

#### Either the asteroids are small and not existential OR we’d have forever to prepare

Martin **Rees 18**. Astronomer Royal, founded the Centre for the Study of Existential Risk, Fellow of Trinity College and Emeritus Professor of Cosmology and Astrophysics at the University of Cambridge. 10/16/2018. On the Future: Prospects for Humanity. Princeton University Press.

You may guess that, being an astronomer, anxiety about asteroid collisions keeps me awake at night. Not so. Indeed, this is one of the few threats that we can quantify— and be confident is unlikely. Every ten million years or so, a body a few kilometres across will hit the Earth, causing global catastrophe— so there are a few chances in a million that such an impact occurs within a human lifetime. There are larger numbers of smaller asteroids that could cause regional or local devastation. The 1908 Tunguska event, which flattened hundreds of square kilometres of (fortunately unpopulated) forests in Siberia, released energy equivalent to several hundred Hiroshima bombs. Can we be forewarned of these crash landings? The answer is yes. Plans are afoot to create a data set of the one million potential Earth- crossing asteroids larger than 50 metres and track their orbits precisely enough to identify those that might come dangerously close. With the forewarning of an impact, the most vulnerable areas could be evacuated. Even better news is that we could feasibly develop spacecraft that could protect us. A ‘nudge’, imparted in space several years before the threatened impact, would only need to change an asteroid’s velocity by a few centimetres per second to deflect it from a collision course with the Earth.