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#### Their techcentric approach to space fosters a new form of biopolitics that maintains a panoptic grasp over all forms of life – their ‘innovation’ becomes another tool of control

Damjanov 15 [Katarina Damjanov is a professor and lecturer in digital media and communication design at the University of Western Australia. Her current research considers the sociomaterial dimensions of media technologies in outer space., The matter of media in outer space: Technologies of cosmobiopolitics, Society and space, pub. 2015//AK]

Although they are to be found thousands and millions of kilometres away from the globe, these earth-born, human-made technologies are intimately tied to the gravities of their terrestrial origin. They are an integral part of global media capital, inseparable from the material and social contexts that frame them as technical objects, epistemic registers, indexes of governance and modes of cultural expression. Thrust into space to follow directives, conduct exploratory measurements and assessments, collect information and relay it to their reception nodes, they constitute an extra-planetary limb of the technological platform that sustains the human pursuit of power, knowledge and wealth. Their design and construction is an outcome of the substantial investments of military-industrial complexes in techno-scientific innovation. Their missions are propelled by the everincreasing demands for mediation systems and services with which to expedite the production and circulation of information, images and data that are considered crucial for securing the interests of the world’s governments, markets and communities. Despite their remote position, these technologies are closely interlinked with terrestrial space through the streams of signals that they exchange with their ground control and whose content is then embedded into the foundations of politics, economy, science, arts and everyday life. Even when they break up, or are abandoned, they remain cemented into the edifice of regulative frameworks, administrative procedures and management agendas, forever bound as property to the states, corporations and organisations on whose behalf they operate. Their presence in space extends the scale, scope and impact of global media apparatus out beyond the terrestrial confines of the earth, thus allowing a novel, ‘extraterrestrial’ perspective from which to rethink our mediatic condition. Media technologies occupy the earth’s exterior as extraterrestrial footprints of global capitalism and its contemporary ‘high-tech’ grasp over vital material and social processes. Their presence in space is at once a result and a resource of the technological evolution of politico-economic regimes grounded in exploitative control of the productive and reproductive ambits of life – what Michel Foucault introduced in contemporary intellectual thought as the order of biopolitics. Foucault’s (1990, 2004, 2007, 2008) work on the genealogy of power over life traced the advancement of its conceptual and operative framework from the principle of sovereign rule over a territory and subjects into a complex governmental platform of biopower whose twofold agenda strives to harness the conduct of human individuals and the life-processes of human populations. While the former, discipline, prescribes and enforces behavioural standards for maximising individual productivities, the latter, biopolitics, regulates the biological and social registers of life to strategically increase the overall productive potential of human living space by seizing, as Foucault (2004: 245) summarised it, ‘control over relations between the human race... and their environment, the milieu in which they live’. The unfolding of the biopolitical episteme in the era of technocentred capitalism subsumed the bounty of ‘life itself’ under the calculative procedures of informatics, logistics and strategic management – and media, communication and information technologies have come to play a fundamental role in its current practices. As works which extended Foucault’s thesis to contemporary techno-logic culture such as Gilles Deleuze’s (1992) ‘Postscript on the Societies of Control’ and Alexander Galloway’s (2004) Protocol have demonstrated, these technologies now determine the conditions in which any human action can occur. Media devices that reside in outer space are necessarily bound up with the question of biopolitics in its ‘high-tech’ era – what commenced with Sputnik as a military contest to secure states’ territorial and geopolitical interests now extends to an extra-territorial edifice of technical media mobilised to fortify global biopolitical regimes. From satellites sent to orbit the earth and collect and relay data to global communication networks, spatial positioning and navigation systems, weather and climate monitoring centres and surveillance grids, to spacecraft dispatched to measure, evaluate and report on other celestial environments and events, these technologies have become a decisive constituent of the security apparatus that underpins contemporary biopolitics. Today, when space-based media lie at the crux of global mechanisms of control, their extraterrestrial position requires us to reconsider the scale at which the currents of biopolitics assume their evolutionary course. The ever-increasing obsessions with advancing mediatic devices with which to inspect and direct the routes of life, from its molecular minutiae to the complex ecologies of the living, facilitate a continuous rescaling of the spectrum of the biopolitical: to govern ‘life itself’ involves, as Eugene Thacker (2009) suggests, encountering and overcoming a multiplicity of scalar restraints. With the possibility of media technologies in outer space, aspirations to strategically interfere with, and capitalise upon, life and the living are presented with a distinct window of opportunity: terrestrial constraints can be circumvented. While providing the essential means for sustaining biopolitical regimes, extraterrestrially situated media apparatus expedites both the micro and macro-scale of their implementation, permitting both their intensive, ubiquitous, terrestrially oriented assertion, and their potentially unlimited spatial expansion outwards. The extraterrestrial presence of media technologies thus impose the need to uncover global topologies of power and governance not only at their planetary level, but also to ‘un-earth’ them within the scale of their cosmic prospects. I describe this extra-planetary capacity of biopolitical progress conveyed by human media advances in space as a nascent order of what I call ‘cosmobiopolitcs’. I use the term in an attempt to both affirm its continuity with a research trajectory established by Foucault, but also to emphasise the radical transformations engendered by the extraterrestrial. I approach media technologies in outer space as a symptomatic register of this cosmobiopolitical leap, suggesting that they not only enable biopolitical gestures to be replicated off-world, but themselves have a decisive impact upon ways in which ‘life itself’ is conceptualised and subjected to technologic forms of control. Increasingly inflecting the human drive to be more and have more, they have become critical to the unfolding of biopolitical regimes.

#### Cosmobiopolilitics exploits life from the workforce, using the narrative of ‘a better future in space’ to extract productivity and erase non-technological aspects of humanity.

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Media technologies that reside in outer space demand site-specific analysis – unlike terrestrially bound devices, they inhabit what is external to earth. Both as a physical and as a discursive site, the location of outer space conditions their mediatic capacity to sculpt human societies. In 1967, the international law declared that outer space was a domain of global commons, placing it outside territorial and property rights and under international regimes of governance. Yet, while this legal provision framed outer space as a ‘common heritage’ of humanity, it remained essentially an inhuman environment; all our encounters with it are always mediated – from the astronaut suit that keeps the human body alive to the Hubble Telescope images of faraway galaxies that once existed before the dawn of our time. Positioned in outer space to overcome its fundamental incompatibility with humans, these devices perform their primary function of technical media, acting as ‘mediators between man and nature’ (Simondon, 1980: 1) and domesticating the unforgiving expanses of the extraterrestrial as a ‘living milieu’ onto which the human and its vital processes could be imprinted and subsequently governed. However, except for a few astronauts currently on roster in the International Space Station, outer space is generally empty of humans, and this absence brings our biopolitical bonds with media technologies into sharp relief: claiming and retaining outer space as a part of the human milieu entirely relies upon our ability to create, manage and control these objects. The biological imperatives of securing the desired modes of relationship between humans and their milieu necessarily involve governance of objects (Thacker, 2009), in particular those of a technical kind, which are, as Gilbert Simondon (1980) and Bernard Stiegler (1998) invite us to consider, historically inseparable from human life. But in the inhuman milieu of outer space, technologies are no longer only a means, or a side concern of governance, but its primary and central objects. Supported by an earthbound pyramid of elite scientific labour and sophisticated equipment, the human relationship with these remotely positioned technologies is indicative of the readjustment of the scope of the biopolitical. It necessitates shifting the governmental focus from living humans towards inanimate objects and their own life in space, and acknowledging the complexities produced in this interweaving of the human and the technological. A distinct stage of our techno-scientific endeavour to exceed our ‘natural’, human and terrestrial limitations, mediatic exploration of space fuels the vectors of technology and currents of life beyond the globe, entangling them into relations which might appear uncannily familiar yet utterly alien to us now. Ongoing media advances in outer space are a major means for shaping what the 2014 symposium at Parsons New School of Design invoked as the contours of ‘Post-Planetary Capital’, heralding a host of intersecting trajectories surrounding ways of thinking at a scale beyond the planetary.1 A critical focus upon the central role of media technologies appears as a crucial contribution to the various arcs of speculative inquiry into ‘post-planetary capital’; this is not least because the operations of these technologies are at the core of all political, scientific, economic and environmental conceptions of human ways of life outside the planet. Media technologies not only underwrite the spatial progress of capitalism, its re-scaling of the commons and the transmutation of its biopolitical rationalities, these objects themselves exert their own material and social effects, providing directional impetus to the idea of planetary and extra-planetary ‘capital’. In this sense, they are not merely artefacts of techno-scientific capability or markers of the assertion of property, nor are they just the scaffolding which supports the evolution of media cultures. They act as a fulcrum upon which the productive agencies of the human and the technological can reposition themselves within the arena of life, demanding continuous reappraisal and redesign of the scope and techniques of its control. This paper brings these diverse technologies together under the analytic rubric of ‘media’ to situate them within the conceptual framework of cosmobiopolitics. In the following sections, I first historicise their role in the articulation of governmental strategies that sustain capitalist expansion and biopolitical control of human ‘living space’. I then consider our mediatic relations with the ‘extra-planetary’ through two case studies; the first on satellites and their debris in earth’s orbital space and the second on steps towards the establishment of interplanetary Internet networks, exploring their potential to sculpt the material and social horizon of our futures on and beyond the globe.

#### The role of private entities in outer space serves as a disruption from the legitimate violence from the state --- the 1AC doesn’t prevent expansion it just solidifies control

Fredriksson and Arvanitakis 17 [Martin Fredriksson Linköping University James Arvanitakis Western Sydney University “Property, Place and Piracy” November 2017 Publisher: RoutledgeISBN: 9781138745131 Projects: Piracy UnboundCommons and Commodities]/ISEE

So, the Orphans rebellion might be closer to Disney’s Jack Sparrow than to ‘Calico Jack’ Rackham and figures like Tumlinson describe the invocation of piracy as tongue in cheek. Nontheless historical figure of the pirate remains a useful heuristic for approaching contemporary space mining. The pirate, as frontier libertarian of the colonial seas, was both anathema to and fundamentally constitutive of the international legal order that began to emerge alongside the ‘juridification of the oceanic commons’ (Policante, 2015, p. xii). A violent appropriator exploiting the ‘free’ spaces outside the sphere of state power, the pirate of the pre-modern world was hostis humani generis – the enemy of all humanity (see Chapter 6 in this volume for a detailed analysis). But, paradoxically, efforts to eradicate piracy solidified the role of European colonial powers as protectors of the oceanic commons and global commerce, simultaneously strengthening the state’s monopoly on legitimate violence on the frontier (Heller-Roazen, 2009; Policante, 2015, p. xii). Although the pirate’s capacity for unrestricted violence in plundering treasure from rival vessels may not resonate with space mining, this section considers whether extraterrestrial resource exploitation can be construed as an act of theft that similarly involves this state/ pirate dialectic. Central to the commingling of piratical lawlessness and the extension of state power onto the frontier is a transformation in the pirate’s legal standing that occurred between the sixteenth and eighteenth centuries. During the European Wars of Religion, a ‘state of exception’ (Agamben, 2005) became solidified in customary law and treaty agreements beginning with the 1559 Treaty of Cateau-Cambrésis. ‘Amity lines’ were drawn to separate the emergent ‘law of nations’ between continental powers and an anomic space ‘beyond the line’,10 where ‘treaties, peace and friendship applied only to Europe, to the Old World, to the area on this side of the line’ (Schmitt, 2006, p. 92). It is within this 130 M. Johnson anomic space where the pirate became employed by the state: those who held a lettre des marques et de représailles (letter of marque and reprisal) were authorised to plunder enemy vessels and treasure without any limit on hostility. The pirate was transformed from lawless freebooter to state-sanctioned privateer: resources appropriated beyond the line were shared between privateers and state coffers, and the privateer became fundamental to European state-building (Policante, 2015, pp. 61–67). Might the frontier beyond the atmosphere comprise a similar state of exception, where the physical distance from the ‘concrete order’ (Schmitt 2006, p. 65) of terrestrial legal and political norms results in an extra-legal or anomic space, free for plunder? Despite the largely pre-emptive juridification of the space frontier via the Outer Space Treaty of 1967 (OST), the legal status of outer space retains a degree of ambiguity. The OST was drafted at the height of Cold War geopolitical tension and subsequently focused more on the militarisation of outer space and undesirability of territorial claims on celestial bodies, as opposed to clarifying the role of non-state actors or providing a framework for commercial activity (Pop, 2000). The treaty established that outer space was res communis: a commons and ‘the province of all mankind’. Article 2 stated that ‘Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.’ Crucially, the treaty has not explicitly forbidden private appropriation of celestial bodies. The clause ‘by any other means’ is possibly enough to prohibit appropriation by non-government actors (Pop, 2000). To more ardent supporters of space mining, however, the emphasis on national appropriation presents a loophole for private enterprise (Kfir, 2016; White, 1998), that ‘an individual acting on his own behalf or on behalf of another individual or a private association or an international organization could lawfully appropriate any part of outer space, including the moon and other celestial bodies’ (Gorove, 1969, p. 351). The US Commercial Space Launch Competitiveness Act of 2015 (CSLCA) appears to take the latter interpretation, whereby the sovereign power of the US legislature endorses private enterprises to ‘act on their own behalf’. Title IV of the Act states: A United States citizen engaged in commercial recovery of an asteroid resource or a space resource … shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States. (US CSLCA, 2015, §402) These ‘international obligations’ are clearly in relation to the OST, and the CSLCA also includes the ‘Extraterritorial Sovereignty Disclaimer’: ‘the United States does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body’ (US CSLCA, 2015, Privateering on the cosmic frontier? 131 §403). The ‘applicable law’ of the act only includes, but it is not limited to, international law: while the precise details regarding enforcement of any space property claims are unclear, such claims could also be protected under US law and competing claims arbitrated in US courts. While the CLSCA would not entail the American flag being planted on the surface of an asteroid, the US is tacitly claiming some level of jurisdiction via acts of corporate appropriation. And, if ‘international obligations’ represent more than just the OST’s nonappropriation principle, the general absence of recognition and endorsement from the international community means that the CSCLA is a largely unilateral assertion.11 The CSLCA effectively positions the US in opposition to other nations – spacefaring or otherwise – seeming to contradict the res communis nature of the OST. It imposes a res nullius legal interpretation of outer space resources by assuming that celestial bodies are free for exploitation, provided no direct territorial claims are made. The United States recognises and enforces its citizens’ resource claims on the space frontier in the name of ‘[developing] in the United States … economically viable, safe and stable’ space resource industries (US CSLCA, 2015, p. 44). This exploitation of the frontier as ‘state of exception’ is an act of economic competition, and the CSLCA then starts to resemble the letter of marque. Resources claimed in outer space will generate tax revenue and further political prerogatives of economic growth (jobs, infrastructure and so on), akin to the role of privateering in European state-building or the granting of royal charters to joint-stock companies like the East India Company. Outer space becomes the province of the United States economy rather than ‘all mankind’ a commercial vanguard enables an indirect form of ‘accumulation by dispossession’ (Harvey, 2004; Dickens & Ormrod 2007, p. 59), pre-emptively stealing resources owned by all. As far as NewSpace’s yearnings for pirate space utopias are concerned, this fundamental reliance on the state’s legislative apparatus implies that the notion of a stateless space frontier is indeed a fantasy. As privateers and patriots, ‘[extending] our free-market values into space’ (Kerber, cited in Space Frontier Foundation, 2015), NewSpace mining firms effectively extend state influence onto the anomic frontier under the guise of entrepreneurial commerce.

#### This biopolitical impulse in space reduces life to the question of survival, and enables the mobilization of the population for war, extinction

Kaye ‘16 (Bradley, Inst. @ Erie Community College and Niagara County Community College, “Biopolitics and the Infected Community: Foucault, Sartre, Esposito, and Butler,” *Fast Capitalism*, Vol. 13 No. 1, 2016, edited)

However, Foucault claims that this direct power to take lives has been sublimated and redirected externally elsewhere. Now, when the sovereign has an attack on power, where the sovereign’s life is in danger, it is within the state’s power to kill the subjects by redirecting their energy into war. It is not direct killing of the subjects by the sovereign, but a redirecting of libidinal energies into the fascism of total war. It was no longer considered that this power of the sovereign over his subjects could be exercised in an absolute and unconditional way, but only in cases where the sovereign’s very existence was in jeopardy: a sort of right of rejoinder. If he were threatened by external enemies who sought to overthrow him or contest his rights, he could then legitimately wage war, and require his subjects to take part in the defense of the state; without directly proposing their death, he was empowered to expose their life: in this sense, he wielded an indirect power over them of life and death. (Foucault, 1978, 135) The state is analogous to the paternalistic family structure, the Roman “Father” looking after its subjects for their own good, disposing of life at any time. There are also ways that the creeping state presence in a bureaucratic Western society creates repressive social modalities that eventually bring every aspect of society under its regulating gaze via the normative aspects of legal state apparatuses. The father’s no has become the yes of consumerism. I will try to construct a viable set of ideological alternatives by juxtaposing the differences between Michel Foucault and Jean-Paul Sartre. In bio-politics risk is spread out over the entire population as: Wars are no longer waged in the name of a sovereign who must be defended; they are waged on behalf of the existence of everyone; entire populations are mobilized for the purpose of wholesale slaughter in the name of life necessity: massacres have become vital. It is as managers of life and survival, of bodies and the race, that so many regimes have been able to wage so many wars, causing so many men to be killed. (Foucault, 1978, 137) As life is exposed it becomes “bare life” increasingly informed by the naked question of survival. In the seventies there was a push towards nuclear disarmament a major question that still lingers, and Foucault presses the issue by saying: “The atomic situation is now at the end point of this process: the power to expose a whole population to death is the underside of the power to guarantee an individual’s continued existence.” (ibid.) Now that his lectures have been published we can see in Society Must be Defended; Security, Territory, Population; The Birth of Biopolitics; and elsewhere how his research on this issue was shaped by textual references within the canonical traditions of philosophy, in particular by many of the Enlightenment Period political philosophers such as Hobbes and Bentham. His work also stems up to the Nazi thinkers and the American neo-liberal capitalist reactions to the rise of Fascism bred by a total and complete paranoia of any state intervention into daily life. All of that has been in the name of biopolitics. Is there an anti-essentialist dimension to even biopolitics? It is hard to pigeon hole Foucault as a philosopher of the institutional aspects of power when he says point blank: “One needs to be nominalistic, no doubt: power is not an institution, and not a structure; neither is it a certain strength we are endowed with; it is the name that one attributes to a complex strategical situation in a particular society” (Foucault, History of Sexuality Volume 1, pg. 93). When I talk with even learned scholars about Foucault there is still a weird idea that he only talks of institutional aspects of power. Discipline and Punish was a political intervention at a particular moment in the early seventies when the prison population was spiraling out of control and my hypothesis is the state was criminalizing minor drug offenses and locking people away as a tactical maneuver to suppress the resistance that had gained popularity in the sixties and seventies which was when the Rockefeller Drug Laws began to take effect; this is also when the problem of prison overcrowding became a major problem which required a move towards prison abolition. History of Madness was written in the early sixties at the beginning of psychoanalysis as a serious medical discourse and psychiatry with talk therapy was starting to gain traction as a widely accepted social phenomenon. As Foucault points out though, these were all methods of creating spaces of incarceration and modes of surveillance on the criminal and mad populations that were deemed to be political threats to the state due to living by non-normative behaviors. The criminalization of madness was also a major tactic of repressive political discourses at that time, which still exist as tropes to this day. As a result of these social institutions the mental hospital and the prison gaining ascendancy as repressive apparatuses that incarcerate and create surveillance the result was a mass homogenization of experience and a total fear that lead to the post-modern surface level “fluffy” simulacrum life experience where every social interaction was an interaction at the level of superficiality. Digging into the depths of the psyche to do the hard inner work of self-transformation would lead to unleashing the negativity that pent up as a result of being harassed by these repressive political institutions. The age-regressions that occur when someone is made slightly uncomfortable when in the seventies capitalism was moving more towards a service economy, retail, office jobs, therapy, health fields, and this leads to the stroking of the bourgeois and petit bourgeois ego from all sides by capitalist consumerism that serves everyone and says “Yes” to any desire. Lower classes are being incarcerated in massive proportions especially racial minorities in the United States. But, in the midst of this, impatience with any subtlety has grown prevalent and the big issue now is that capitalism always says yes, even to the most perverse desires and horrific violent transgressions. Experiences can be bought at least as simulacrums in virtual or tele-visual forms. Acting out in a repressive society has taken the form of simulated acting out, actors acting out parts on television and in movies, but in reality workers (and especially women) are more repressed now than ever before. Now truth has become nothing more than accrued habits and whatever helps everyone feel comfortable and satisfied. For some reason the discourse of bio-politics is extremely seductive in garnering support for American imperialistic endeavors abroad, the subjects seem to [ignore] the violence inflicted by the US Military when it is conducted as a humanitarian “peace-keeping” mission. Or, as Roberto Esposito points out the way of garnering the alleged consent of the masses for a war effort is by positing the necessity to take life in order to preserve life. Often in Bosnia, Iraq, Afghanistan and Libya, the US Government bombed the so-called enemies while they also air dropped medical supplies. The taking of life is problematically coupled with the desire for immunization, to create death and destruction while also trying to sanitize, clean up, and “fix” the broken situation. The Affordable Care Act is no such exception to the rule. It tries to offer healthcare to workers who will remain productive in an effort to maintain the working class as healthy subjects, but it is a prescriptive measure designed to put a band-aid on the problems of health that arise when the workers are worn down due to frenetic bodily activities of manual labor, and the stasis of intellectual immaterial office work which contributes to certain health risks such as obesity. It is the bio-political ethos in praxis, because the predominant political discourse surrounding the pro and con positions regarding the reforms was almost always economic in nature. Does the policy save consumers money? Does it save the government money? Nowhere in the discussion was there any analysis that perhaps capitalism contributes to these health related issues that need preventative care, or in the pseudo-debates about veterans’ health care that their health problems are a direct result of bio-political discourses that provoked wars over the last ten to twenty years. There is a certain matrix by which the bio-political conversation has continued unabated.

#### The role of the ballot is to embrace specific intellectualism, uncovering the weak points in regimes of knowledge production, you should weigh the power relations latent in each advocacy against each other

Owen 97. David Owen, professor of social sciences at Southampton University, 1997, “Maturity and Modernity: Nietszche, Weber, Foucault and the ambivalence of reason,” Routledge publishers, published July 22, 1997

In our reflections on Foucault’s methodology, it was noted that, like Nietszche and Weber, he commits himself to a stance of value-freedom as an engaged refusal to legislate for others. Foucault’s critical activity is oriented to human autonomy yet his formal account of the idea of autonomy as the activity of self-transformation entails that the content of this activity is specific to the struggles of particular groups and individuals. Thus, while the struggle against humanist forms of power/knowledge relations denotes the formal archiectonic interest of genealogy as critique, the determination of the ‘main danger’ which denotes the ‘filling in’ of this interest is contingent upon the dominant systems of constraint confronted by specific groups and individuals. For example, the constitution of women as ‘hysterical,’ of blacks as ‘criminal,’ of homosexuals as ‘perverted’ all operate through humanist forms of power/knowledge relations, yet the specificity of the social practices and discourses engaged in producing these ‘identities’ entails that while these struggles share a general formal interest in resisting the biopolitics of humanism, their substantive interests are distinct. It is against this context that Foucault’s stance of value-freedom can be read as embodying a respect for alterity. The implications of this stance for intellectual practice became apparent in Foucault’s distinction between the figures of the ‘universal’ and ‘specific’ intellectual. Consider the following comments: In a general way, I think that intellectuals-if this category exists, which is not certain or perhaps even desirable- are abandoning their old prophetic function. And by that I don’t mean only their claim to predict what will happen, but also the legislative function that they so long aspired for: ‘See what must be done, see what is good, follow me. In the turmoil that engulfs you all, here is the pivotal point, here is where I am.’ The greek wise man, the jewish prophet, the roman legislators are still models that haunt those who, today, practice the profession of speaking and writing. The universal intellectual, on Foucault’s account, is that figure who maintains a commitment to critique as a legislative activity in which the pivotal positing of universal norms (or universal procedures for generating norms) grounds politics in the ‘truth; of our being (e.g. our ‘real’ interests). The problematic form of this type of intellectual practice is a central concern of Foucault’s critique of humanist politics in so far as humanism simultaneously asserts and undermines autonomy. *If*, however, this is the case, what alternative conceptions of the role of the intellectual and the activity of critique can Foucault present to us? Foucault’s elaboration of the figure of the ‘specific’ inellectual provides the beginnings of an answer to this question: I dream of the intellectual who destroys evidence and generalities, the one who, in the inertias and constraints of the present time, locates and marks the weak points, the openings, the lines of force, who is incessantly on the move, doesn’t know exactly where he is heading nor what he will think tomorrow for he is too attentive to the present. The historicity of thought, the impossibility of locating an Archimedean point outside of time, **leads Foucault to locate intellectual activity as an ongoing** attentiveness to the present **in terms of what is singular** and arbitrary **in what we take to be universal** and necessary. Following from this, **the intellectual does not seek to offer** grand theories **but** specific analyses**,** not global but local criticism. We should be clear on the latter point for it is necessary to acknowledge that Foucault’s position does not entail the impossibility of ‘acceding to a point of view that could give us access to any complete and definitive knowledge of what may constitute our historical limits’ and, consequently, ‘ we are always in the position of beginning again’ (FR p. 47). The upshot of this recognition of the partial character of criticism is not, however, to produce an ethos of fatal resignation but, in far as it involves a recognition that everything is dangerous, ‘a hyper-and pessimistic activism’ (FR p. 343). In other words, it is the very historicity and partiality of criticism which bestows on the activity of critique its dignity and urgency. What of this activity then? We can sketch the Foucault account of the activity of critique by coming to grips with the opposition he draws between ‘ideal’ critique and ‘real’ transformation. Foucault suggests that the activity of critique ‘is not a matter of saying that things are not right as they are’ but rather ‘of pointing out what kinds of assumptions, what kinds of familiar, unchallenged, uncontested modes of thought and practices we accept rest’ (PPC p. 154). This distinction is perhaps slightly disingenuous, yet Foucault’s point is unintelligible if we recognize his concern to disclose the epistemological grammar which informs our social practices as the starting point of critique. This emerges in his recognition that ‘criticism (and radical criticism) is absolutely indispensable for any transformation’: A transformation that remains within the same mode of thought, a transformation that is only a way of adjusting the same thought more closely to the reality of things can merely be a superficial transformation. (PPC p. 155) The genealogical thrust of this critical activity is ‘to show that things are not as self-evident as one believed, to see that what is accepted as self-evident is no longer accepted as such’ for ‘as soon as one can no longer think things as one formerly thought them, transformation becomes both very urgent, very difficult, and quite possible’ (PPC p. 155). The urgency of transformation derives from the contestation of thought (and the social practices in which it is embedded) as the form of our autonomy, although this urgency is given its specific character for modern culture by the recognition that the humanist grammar of this thought ties us into the technical matrix of biopolitics. The ‘specificity’ of intellectual practice and this account of the activity of critique come together in the refusal to legislate a universal determination of ‘what is right’ in favour of the perpetual problematisation of the present. It is not a question, for Foucault, of invoking a determination of who we are as a basis for critique but of locating what we are now as the basis for a reposing of the question, “who are we?” the role of the intellectual is thus not to speak on behalf of others (the dispossessed, the downtrodden) **but to** create the space **within which** their struggles become visible **such that these others** can speak for themselves. The question remains, however, as to the capacity of Foucault’s work to perform this critical activity through an entrenchment of the ethics of creativity as the structures of recognition through which we recognize our autonomy in the contestation of determinations of who we are.

**We should imagine a world where things aren’t what they seem – the desire of the 1ac is the opposite of the life guided by reason – return to immanence and embrace contingency**

**Gulli 16** (Bruno Gulli - teaches philosophy at Long Island University, “Sovereign Violence and the Power of Acting – (Imagining the Unsovereign Law)”, A Journal of the Social Imaginary, 2016, <https://cab.unime.it/journals/index.php/IMAGO/article/viewFile/1307/1024>, MG)

A critique of sovereign violence, therefore, cannot simply rest on the reality of affects and desire and the deterministic tendencies engendered by it. What must be taken into account by such a critique is the fact of contingency –as well as the awareness of it. **Being aware of contingency means imagining how things could be other than they are**. Obviously, this awareness and this imagination are not found in the detached place of a simple and unified subject, but rather in the multiple conditions of subjectification and in the process of individuation –and this is what determination amounts to. Yet, a vortex of original contingency and freedom must exist if we are to posit the possibility of change. Things can change –as John Duns Scotus notes— because they are possible, rather than necessary (Duns Scotus 1987: 44). Indeed, “**those who deny that some being is contingent should be exposed to torments until they concede that it is possible for them not to be tormented**” (9). Something different can be imagined only because it is possible –and possibility is part of reality. So when Lordon denies what he calls “the tense of regret” as “a retrospective illusion” and as “the Spinozist non-sense par excellence,” he is perhaps denying the reality, or actuality, of potentiality (Lordon 2014: 143). He says that “to be able to do and to do are one and the same thing: we could only have done what we did, neither more nor less” (143-144). But I find this unrealistic and false. For instance, I could have gone to the movies last night even though I didn’t. I believe that, even from a Spinozist point of view, the denial of ‘I could have,’ which I would not necessarily call “the tense of regret,” is a bit too strong. (Let us also note that the tense of regret is rather ‘I should have’ and admit that regret itself is in any case an important moment in human experience – and that we often learn from it.) That denial does in fact reduce reality to what is simply there, the merely given, by excluding potentiality. For it seems impossible to deny ‘I could have’ without at the same time also denying the ‘I could’ of transformation and change. To be sure, Lordon does not at all rule out change. But he inscribes it in a determinist –though he specifies, non-fatalist—ontology. For instance, he says, When the indignation that gets people moving prevails over the obsequium that makes them stay put, a new affective vector is formed, and individuals who used to be determined to respect institutional norms … are suddenly determined to sedition (140). But what accounts for this indignation? I would suggest that it is not at all a matter of determinism or free will. As far as I know, one of the most interesting takes on this issue is Jean-Paul Sartre’s denunciation of it as a false problem. At the outset of the chapter on freedom in Being and Nothingness, Sartre says, It is strange that philosophers have been able to argue endlessly about determinism and free will, to cite examples in favor of one or the other thesis without ever attempting first to make explicit the structures contained in the very idea of action (1956: 559). For Sartre, an action must be intentional: “The careless smoker who has through negligence caused the explosion of a powder magazine has not acted” (ibid.). This intentionality is what makes agents (bodies) expend their freedom, their nothingness. But as Sartre famously says, there is no exit from it, “we do not choose to be free” (623). We are “thrown into freedom,” condemned to it (ibid.). Sartre provides the solution to the false problem mentioned above, the paradox of freedom, by means of the notion of ‘situation’: “there is freedom only in a situation, and there is a situation only through freedom” (629). Situation means determination, but outside the logic of determinism. **Freedom means power to act, outside the illusion of a free will**. A critique of sovereignty also needs to posit something outside sovereignty. **However, this is not a moment of transcendence; rather, it is a return into immanence**. To say that there is a return to immanence seems to imply that there was an exit from it. In fact, there was no exit, but only the positing of a fictitious reality, **the illusion of sovereignty as a totality**. **The end of that illusion gives the sense of a return into what has always already been there**. In fact, it is sovereignty itself – sovereignty’s first and foremost expression of violence—that by positing itself as separate and distant creates a **metaphysical and fictitious paradigm of power** as potestas (authority) rather than potentia (potency). The fact that the paradigm is fictitious does not mean that it lacks real efficacy. What it lacks is **authenticity** and, if you will, **legitimacy**. Yet, it is a real and effective power. Lordon is absolutely right when he says, on the basis of Spinoza, that there “is no potestas that does not emanate from potentia(multitudinis) –but in the form of hijacking and to the advantage of the most powerful of master-desires, the desire of the sovereign” (160-161). **What must be shown is that the desire of the sovereign –a despotic desire—is the opposite of the life guided by reason, and closer to freedom, defining the desire of the multitude**. It is this reason that is neither private nor public, but something altogether different. In fact, it is common reason, that is to say, humanity.

## Case

### Collisions

#### No miscalc or escalation

James Pavur 19, DPhil Researcher at the Cybersecurity Centre for Doctoral Training at Oxford University, and Ivan Martinovic, Professor of Computer Science in the Department of Computer Science at Oxford University, “The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space”, 2019 11th International Conference on Cyber Conflict: Silent Battle, https://ccdcoe.org/uploads/2019/06/Art\_12\_The-Cyber-ASAT.pdf

A. Limited Accessibility

Space is difficult. Over 60 years have passed since the first Sputnik launch and only nine countries (ten including the EU) have orbital launch capabilities. Moreover, a launch programme alone does not guarantee the resources and precision required to operate a meaningful ASAT capability. Given this, one possible reason why space wars have not broken out is simply because only the US has ever had the ability to fight one [21, p. 402], [22, pp. 419–420].

Although launch technology may become cheaper and easier, it is unclear to what extent these advances will be distributed among presently non-spacefaring nations. Limited access to orbit necessarily reduces the scenarios which could plausibly escalate to ASAT usage. Only major conflicts between the handful of states with ‘space club’ membership could be considered possible flashpoints. Even then, the fragility of an attacker’s own space assets creates de-escalatory pressures due to the deterrent effect of retaliation. Since the earliest days of the space race, dominant powers have recognized this dynamic and demonstrated an inclination towards de-escalatory space strategies [23].

B. Attributable Norms

There also exists a long-standing normative framework favouring the peaceful use of space. The effectiveness of this regime, centred around the Outer Space Treaty (OST), is highly contentious and many have pointed out its serious legal and political shortcomings [24]–[26]. Nevertheless, this status quo framework has somehow supported over six decades of relative peace in orbit.

Over these six decades, norms have become deeply ingrained into the way states describe and perceive space weaponization. This de facto codification was dramatically demonstrated in 2005 when the US found itself on the short end of a 160-1 UN vote after opposing a non-binding resolution on space weaponization. Although states have occasionally pushed the boundaries of these norms, this has typically occurred through incremental legal re-interpretation rather than outright opposition [27]. Even the most notable incidents, such as the 2007-2008 US and Chinese ASAT demonstrations, were couched in rhetoric from both the norm violators and defenders, depicting space as a peaceful global commons [27, p. 56]. Altogether, this suggests that states perceive real costs to breaking this normative tradition and may even moderate their behaviours accordingly.

One further factor supporting this norms regime is the high degree of attributability surrounding ASAT weapons. For kinetic ASAT technology, plausible deniability and stealth are essentially impossible. The literally explosive act of launching a rocket cannot evade detection and, if used offensively, retaliation. This imposes high diplomatic costs on ASAT usage and testing, particularly during peacetime.

C. Environmental Interdependence

A third stabilizing force relates to the orbital debris consequences of ASATs. China’s 2007 ASAT demonstration was the largest debris-generating event in history, as the targeted satellite dissipated into thousands of dangerous debris particles [28, p. 4]. Since debris particles are indiscriminate and unpredictable, they often threaten the attacker’s own space assets [22, p. 420]. This is compounded by Kessler syndrome, a phenomenon whereby orbital debris ‘breeds’ as large pieces of debris collide and disintegrate. As space debris remains in orbit for hundreds of years, the cascade effect of an ASAT attack can constrain the attacker’s long-term use of space [29, pp. 295– 296]. Any state with kinetic ASAT capabilities will likely also operate satellites of its own, and they are necessarily exposed to this collateral damage threat. Space debris thus acts as a strong strategic deterrent to ASAT usage.

#### Hotlines solve

Chen Lan 15, Writer on the Chinese Space Program, Go Taikounauts, http://www.go-taikonauts.com/images/newsletters\_PDF/GoTaikonauts18.pdf

Though Sino-U.S. cooperation on human spaceflight is still uncertain, a positive move between the two countries has been made, that is the establishment of a space hotline. Western media reported in November that the hotline has been setup between Washington and Beijing to allow easy sharing of technical information about their space operations, hopefully avoiding any misunderstandings or accidents.

#### No cyber impact---every scenario is empirically denied

James Andrew **Lewis 18**, senior vice president at the Center for Strategic and International Studies, Ph.D. from the University of Chicago, January 2018, “Rethinking Cybersecurity: Strategy, Mass Effect, and States,” <https://espas.secure.europarl.europa.eu/orbis/sites/default/files/generated/document/en/180108_Lewis_ReconsideringCybersecurity_Web.pdf>, p. 7-11

The most dangerous and damaging attacks required resources and engineering knowledge that are beyond the capabilities of nonstate actors, and those who possess such capabilities consider their use in the context of some larger strategy to achieve national goals. Precision and predictability—always desirable in offensive operations in order to provide assured effect and economy of force—suggest that the risk of collateral damage is smaller than we assume, and with this, so is the risk of indiscriminate or mass effect.

State Use of Cyber Attack Is Consistent with Larger Strategic Aims

Based on a review of state actions to date, cyber operations give countries a new way to implement existing policies rather than leading them to adopt new policy or strategies. State opponents use cyber techniques in ways consistent with their national strategies and objectives. But for now, cyber may be best explained as an addition to the existing portfolio of tools available to nations.

Cyber operations are ideal for achieving the strategic effect our opponents seek in this new environment. How nations use cyber techniques will be determined by their larger needs and interests, by their strategies, experience, and institutions, and by their tolerance for risk. Cyber operations provide unparalleled access to targets, and the only constraint on attackers is the risk of retaliation—a risk they manage by avoiding actions that would provoke a damaging response. This is done by staying below an implicit threshold on what can be considered the use of force in cyberspace.

The reality of cyber attack differs greatly from our fears. Analysts place a range of hypothetical threats, often accompanied by extreme consequences, before the public without considering the probability of occurrence or the likelihood that opponents will choose a course of action that does not advance their strategic aims and creates grave risk of damaging escalation. Our opponents' goals are not to carry out a cyber 9/11. While there have been many opponent probes of critical infrastructure facilities in numerous countries, the number of malicious cyber actions that caused physical damage can be counted on one hand. While opponents have probed critical infrastructure networks, there is no indication that they are for the purposes of the kind of crippling strategic attacks against critical infrastructure that dominated planning in the Second World War or the Cold War.

Similarly, the popular idea that opponents use cyber techniques to inflict cumulative economic harm is not supported by evidence. Economic warfare has always been part of conflict, but there are no examples of a country seeking to imperceptibly harm the economy of an opponent. The United States engaged in economic warfare during the Cold War, and still uses sanctions as a tool of foreign power, but few if any other nations do the same. The intent of cyber espionage is to gain market or technological advantage. Coercive actions against government agencies or companies are intended to intimidate. Terrorists do not seek to inflict economic damage. The difficulty of wreaking real harm on large, interconnected economies is usually ignored.

Economic warfare in cyberspace is ascribed to China, but China's cyber doctrine has three elements: control of cyberspace to preserve party rule and political stability, espionage (both commercial and military), and preparation for disruptive acts to damage an opponent's weapons, military information systems, and command and control. "Strategic" uses, such as striking civilian infrastructure in the opponent's homeland, appear to be a lower priority and are an adjunct to nuclear strikes as part of China's strategic deterrence. Chinese officials seem more concerned about accelerating China's growth rather than some long-term effort to undermine the American economy.6 The 2015 agreement with the United States served Chinese interests by centralizing tasking authority in Beijing and ending People's Liberation Army (PLA) "freelancing" against commercial targets.

The Russians specialize in coercion, financial crime, and creating harmful cognitive effect—the ability to manipulate emotions and decisionmaking. Under their 2010 military doctrine on disruptive information operations (part of what they call "New Generation Warfare"). Russians want confusion, not physical damage. Iran and North Korea use cyber actions against American banks or entertainment companies like Sony or the Sands Casino, but their goal is political coercion, not destruction.

None of these countries talk about death by 1000 cuts or attacking critical infrastructure to produce a cyber Pearl Harbor or any of the other scenarios that dominate the media. The few disruptive attacks on critical infrastructure have focused almost exclusively on the energy sector. Major financial institutions face a high degree of risk but in most cases, the attackers' intent is to extract money. There have been cases of service disruption and data erasure, but these have been limited in scope. Denial-of-service attacks against banks impede services and may be costly to the targeted bank, but do not have a major effect on the national economy. In all of these actions, there is a line that countries have been unwilling to cross.

When our opponents decided to challenge American "hegemony," they developed strategies to circumvent the risks of retaliation or escalation by ensuring that their actions stayed below the use-of-force threshold—an imprecise threshold, roughly defined by international law, but usually considered to involve actions that produce destruction or casualties. Almost all cyber attacks fall below this threshold, including, crime, espionage, and politically coercive acts. This explains why the decades-long quest to rebuild Cold War deterrence in cyberspace has been fruitless.

It also explains why we have not seen the dreaded cyber Pearl Harbor or other predicted catastrophes. Opponents are keenly aware that launching catastrophe brings with it immense risk of receiving catastrophe in return. States are the only actors who can carry out catastrophic cyber attacks and they are very unlikely to do so in a strategic environment that seeks to gain advantage without engaging in armed conflict. Decisions on targets and attack make sense only when embedded in their larger strategic calculations regarding how best to fight with the United States.

There have been thousands of incidents of cybercrime and cyber espionage, but only a handful of true attacks, where the intent was not to extract information or money, but to disrupt and, in a few cases, destroy. From these incidents, we can extract a more accurate picture of risk. The salient incidents are the cyber operations against Iran's nuclear weapons facility (Stuxnet), Iran's actions against Aramco and leading American banks, North Korean interference with Sony and with South Korean banks and television stations, and Russian actions against Estonia, Ukrainian power facilities, Canal 5 (television network in France), and the 2016 U S. presidential elections. Cyber attacks are not random. All of these incidents have been part of larger geopolitical conflicts involving Iran, Korea, and the Ukraine, or Russia's contest with the United States and NATO.

There are commonalities in each attack. All were undertaken by state actors or proxy forces to achieve the attacking state's policy objectives. Only two caused tangible damage; the rest created coercive effect, intended to create confusion and psychological pressure through fear, uncertainty, and embarrassment. In no instance were there deaths or casualties. In two decades of cyber attacks, there has never been a single casualty. This alone should give pause to the doomsayers. Nor has there been widespread collateral damage.

#### No warrant for why – the other 50 percent of satilites doesn’t solve

### Sino

#### No China-India war---interdependence and institutionalism.

Gaurav **Kampani &** Bharath **Gopalaswamy** **17**. \*\*Assistant Professor for the Henry Kendall College of Arts & Sciences at The University of Tulsa, Ph.D., Cornell University. \*\*Director, South Asia Center, Atlantic Council, PhD in mechanical engineering with a specialization in numerical acoustics from Trinity College, Dublin. Foreword to “Asia in the ‘Second Nuclear Age’” Atlantic Council – South Asia Center. November, http://www.atlanticcouncil.org/images/Asia\_in\_the\_Second\_Nuclear\_Age\_web\_1115.pdf.

Politically, **the regional competitors do not find themselves in security dilemmas** in which the existence of their political systems is at stake, as did the competitors during the Cold War. China, India, and Pakistan are **stakeholders in the existing international order**, and are committed to an **open economic order and multilateral institutionalism**. Further, unlike the pre-World War I era, no competitor in the second nuclear age is part of rigid alliance systems engaged in repeated crises driven by notions of absolute gains. In the **China-India nuclear dyad**, the sources of conflict are unsettled boundary disputes, naval rivalry in the Indian Ocean, and more general Chinese goals to deny India peer-power status by boxing it in South Asia with Pakistan. But, this does not rise to the level of either the Anglo-German, Franco-German, or Russo-German rivalries in Europe prior to World War I. **Neither do Beijing or New Delhi see themselves as engaged in a Manichaean rivalry** of the sort that bedeviled the great powers between the two world wars, and the superpowers after them. Both China and India regard economic growth as the criteria for national success, and political stability as the means to **great-power status**. More significantly, each views robust conventional means—and **not nuclear arsenals**—as the means to addressing great-power aspirations. The India-Pakistan dyad elicits greater concern. The hundred-year struggle between the two countries is ideological and strategic. It is deeply embedded in each state’s national identity, which makes it difficult to resolve. But, here again, two critical mitigating factors provide hope. First, Pakistan has not expanded the scope and intensity of its LIC against India. A status quo has descended on the conflict, as the “ugly stability” between the two rivals has not gotten uglier.34 Within Pakistan, there is now greater questioning of the LIC’s blowback effects on Pakistan’s domestic peace. Pakistan’s defense and foreign-policy approaches also show fractures along institutional fault lines, with its deep state (military and intelligence agencies) taking the hard line and mainstream political parties professing a more moderate line. India, on the other hand, is veering around to the consensus that the LIC does not constitute an existential threat to its security. Among India’s national security elites, there is further acknowledgment of the institutional divisions within Pakistan and the belief that India ought to pursue multiple foreign policies to deal with Pakistan’s civil and military establishments. Successive Indian governments also appear to have quietly concluded that escalation to a conventional counterattack against Pakistan could end up in self-defeat. There are other sophisticated options available to India, including covert attacks using special forces, diplomatically isolating Pakistan, and legal sanctions through the United Nations. This new Indian approach is also driven by the conviction that Pakistan is in secular decline, and that, above all else, state failure in Pakistan would constitute the greatest threat to Indian security. This suggests that tensions between Pakistan and India have likely plateaued. The political rivalry between the three nuclear states is also a function of geography and structure. India and China—given their geographic depth and mountainous defenses, demographic size, and large modern conventional forces—do not perceive the other as a grave threat to national security. The case is different in the India-Pakistan dyad, where structural factors clearly favor India. However, the relatively static nature of the LIC and India’s quiet decision to walk back from threatening Pakistan with an escalatory conventional war mean that the risk of a war in South Asia is probably at its lowest levels since the late 1980s. Overall, this is a positive development. China and India also **share a common strategic culture** of treating **nuc**lear weapon**s** as political weapons, as **instruments of deterrence** rather than of war fighting. This shared culture is generally attributed to two factors. One is that structural advantages of geographical depth and defenses lessen the propensity of either state to turn to nuclear weapons as its primary means of security. The other is that structure is inevitably intertwined with cultural beliefs held by Chinese and Indian leaders of the political, rather than military, utility of nuclear weapons. Further, civilians in both states retain the upper hand in their institutional relationship with the military. This means that **nuc**lear operational postures and doctrine stem from political beliefs and rationales, and **not from military operational pressures**, which often produce unstable forward-deployed and hair-trigger postures. To be sure, Pakistan’s case is different. Pakistan’s military has transmogrified into a praetorian guard that has captured the Pakistani state, and has subverted the state’s strategic interests to its narrower institutional interests. Nonetheless, there is no evidence yet that Pakistan is preparing to exceed the numerical limits of the French and British arsenals. More reassuringly, there is also no evidence that Pakistan is embracing highalert and on-the-ready deployment postures.

### Astronomy

**No asteroids impact**

Mike Wall 16 (Mike Wall has been writing for Space.com since 2010. His book about the search for alien life, “Out There,” was published on Nov. 13, 2018. Before becoming a science writer, Michael worked as a herpetologist and wildlife biologist. He has a Ph.D. in evolutionary biology from the University of Sydney, Australia, a bachelor’s degree from the University of Arizona, and a graduate certificate in science writing from the University of California, Santa Cruz, 8/2/16, accessed 10/14/21, “Is Earth Safe from Asteroid Bennu?”, https://www.scientificamerican.com/article/is-earth-safe-from-asteroid-bennu/)AGabay

But, mission officials stressed, that chance is **slim**, and the **space rock** is not nearly **big enough** to pose an **existential threat** to the **planet**, despite what some media reports claimed over the weekend. [Potentially Dangerous Asteroids (Images)] "We're not talking about an **asteroid** that could **destroy the Earth**," OSIRIS-REx principal investigator Dante Lauretta, of the Lunar and Planetary Laboratory at the University of Arizona, told Space.com. "We're not anywhere near that kind of **energy** for an **impact**." SAMPLING AN ASTEROID If all goes according to plan, the $800 million OSIRIS-REx (Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer) mission will lift off atop a United Launch Alliance Atlas V rocket from Florida's Cape Canaveral Air Force Station on Sept. 8. The spacecraft will spend two years chasing Bennu down, finally rendezvousing with the near-Earth asteroid in August 2018. OSIRIS-REx will then study the space rock from orbit for another two years before grabbing at least 2.1 ounces (60 grams) of surface material in July 2020. In 2023, this relatively hefty sample should make it back to Earth, where researchers in laboratories around the globe will analyze the material in a number of ways. The mission team is chiefly interested in learning the role that asteroids like Bennu — dark, primitive and apparently carbon-rich objects — may have played in helping life get a foothold on Earth, Lauretta said. "Did these kinds of bodies deliver organic material and water, in the form of hydrated minerals like clays, to the surface of our planet that created the habitability and the environments that may have led to the origin of life?" Lauretta said. "That's the prime mission," to investigate that question, he added. There are secondary objectives as well, including learning more about the valuable resources that Bennu-like asteroids may harbor, Lauretta said. And then there's the planetary-defense angle, which has gotten a lot of attention in the last few days. A POTENTIALLY HAZARDOUS ASTEROID Bennu is officially classified as a potentially dangerous asteroid. In fact, there's an 0.037 percent (or 1-in-2,700) chance that it will **strike Earth** in the last quarter of the 22nd century, NASA scientists have calculated. Specifically, that's the probability that, during an Earthy flyby in 2135, Bennu will hit a special orbit-altering "keyhole" that will send it on a collision course with the planet later in the century. OSIRIS-REx will help scientists refine those odds, by refining their understanding of Bennu's orbit. (That orbit, by the way, is already the best-known of any asteroid, Lauretta said; thanks to extensive observations since Bennu's 1999 discovery, astronomers have nailed the space rock's orbital radius down to within 20 feet, or 6 m.) "Our uncertainties will shrink, so that will allow us to recalculate the **impact probability**," Lauretta said. "We don't know which direction it'll go. It could go down, because we just eliminated a bunch of possible keyholes that Bennu may hit. Or it may go up, because in the area that's left we have a higher concentration of keyholes compared to the overall area of the uncertainty plane." OSIRIS-REx's work will also help researchers better understand the Yarkovsky effect, which describes how absorbed sunlight, when radiated away as heat, affects an object's trajectory. Such information will improve knowledge not only of where Bennu is headed, but where it came from, Lauretta said. But to focus on where it's headed—what if Bennu does hit one of those keyholes in 2135, and the space rock squares Earth up for an impact in 2185 or thereabouts? What should humanity expect? Such an impact would likely devastate the local area but fall short of wiping out **civilization** or **causing a mass extinction**, experts have said. Astronomers estimate that a space rock must be at least 0.6 miles (1 kilometer) wide to cause a global catastrophe. (For perspective: The asteroid thought to have wiped out the dinosaurs—or at least to have finished them off—was probably about 6 miles, or 10 km, across.) But an impact would not be **inevitable**, even if Bennu had Earth in its sights. Given a decade or so worth of **lead time**, researchers say, an incoming asteroid could potentially be **nudged off course** using fly-along "**gravity tractor**" **probes** and/or "**kinetic impactors**." And if time is not on humanity's side, there's always the **nuclear option**.

#### No grid impacts

Maggie Koerth 18 (Maggie Koerth is a senior science writer for FiveThirtyEight, 8/13/18, accessed 10/20/21, “Hacking The Electric Grid Is Damned Hard”, https://fivethirtyeight.com/features/hacking-the-electric-grid-is-damned-hard/)AGabay

But, surprisingly, some electrical system experts are thinking about it in a different way. Cyberattacks on the grid are a real risk, they told me. But the worst-case scenarios we’re imagining aren’t that likely. Nor is this a short-term crisis, with risks that can be permanently solved. Bringing down the grid is a lot harder than just **flicking a switch**, but the danger is real — and it may never go away. Representatives from two nonprofit organizations — both of which play large roles in how the electric grid is regulated and maintained — said it is easier to imagine disaster scenarios than create one. “There’ve been some very sensational books out there about the grid going dark because someone’s got their finger ready over a mouse and everything is going to turn off at the same time,” said Bill Lawrence, vice president and chief security officer at the North American Electric Reliability Corporation, the regulatory authority that sets and enforces technological standards for utility companies across the continent. “The grid does not work that way.” Our electric infrastructure is chock-full of both **redundancies** and **regional variations** — two things that impede widespread sabotage. That’s not to say that the grid isn’t under attack. Lawrence acknowledged that there is interest in “trying to hurt us from a distance.” But he emphasized there have not yet been any successful attacks — meaning hackers haven’t caused any blackouts.

Chart

Description automatically generated

They’ve been poking at our critical infrastructure for a long while. Incident reports published by the Industrial Control Systems Cyber Emergency Response Team — a division of Homeland Security that does training and responds to cyberattacks on critical infrastructure — suggest that electricity, oil and natural gas infrastructure have been routinely targeted for years.1 There are dozens of these attacks reported to ICS-CERTS annually. However, it would be difficult for these attacks to lead to **wide-scale blackouts**, according to Lawrence and Candace Suh-Lee, who leads a cybersecurity research team at the Electric Power Research Institute, a nonprofit research and development lab. And that’s true even if hackers do eventually succeed in taking control of some electric systems. It helps that the North American electric grid is both **diverse** in its **engineering** and **redundant** in its **design**. For instance, the Ukrainian attacks are often cited as evidence that hundreds of thousands of Americans could suddenly find themselves in the dark because of hackers. But Lawrence considers the Ukrainian grid a lot easier to infiltrate than the North American one. That’s because Ukraine’s infrastructure is more homogeneous, the result of electrification happening under the standardizing eye of the former Soviet Union, he told me. The North American grid, in contrast, began as a patchwork of unconnected **electric islands**, each designed and built by companies that weren’t coordinating with one another. Even today, he said, the enforceable standards set by NERC don’t tell you exactly what to buy or how to build. “So taking down one utility and going right next door and doing the same thing to that neighboring utility would be an extremely difficult challenge,” he said. Meanwhile, the electric grid already contains a lot of redundancies that are built in to prevent blackouts caused by common problems like broken tree limbs or heat waves — and those redundancies would also help to prevent a successful cyberattack from affecting a **large number** of **people**. Suh-Lee pointed to an August 2003 blackout that turned the lights off on 50 million people on the east coast of the U.S. and Canada. “When we analyzed it, there was about 17 different things lined up that went wrong. Then it happened,” she said. Hackers wouldn’t necessarily have control over all the things that would have to go wrong to create a blackout like that. In contrast, Suh-Lee said, scenarios that sound like they should lead to major blackouts … haven’t. Take the 2013 Metcalf incident, where snipers physically attacked 17 electric transformers in Silicon Valley. Surrounding neighborhoods temporarily lost power, but despite huge energy demand in the region, “the big users weren’t even aware Metcalf had happened,” she said.