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The Cosmos is Not Finished

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in Theory and Criticism

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Abstract

The “Final Frontier” is the Cosmic Order of Coloniality. The frontier, the final frontier, the new frontier, the endless frontier – all oft-used analogies for outer space. This cosmic order, hegemonically superior since the late 1960s, even while losing popular and political power, orders the very essence of Western space exploration, its future, and possibilities. The Final Frontier is a totalizing and finalizing conception of Man and his future. Such an order reduces ways of knowing and being to colonial and capitalist modes, where all things are reduced to exploitation. In this, the future of the final frontier is hardly a future; it is a death march masked as salvation. Part of this appearance of salvation and actuality of death comes from the Puritan values that have stayed within the American cultural landscape, transformed into its secular counterpart: Survival, another aspect is that of the glorification of What Has Been, which is death. This glorification of death is itself concealed by the valuation of control and power, the expansion of the State and land. While the Final Frontier as a cosmic order is one of exploitation and control, this does not mean there is no Hope for a future. Indeed, while this work looks at the ways in which coloniality manifests in the American cosmic order in different forms (the values and norms of space advocates, the use of Frontierism in space policy and the public perceptions of the goals of space exploration), there is another way—it is not hegemonic, nor an easy road, but through the decolonization of the American narrative of space exploration lies a way forward: Hope, Cosmic Awe and Cosmic Revolution, the engagement with the unique material conditions of outer space that can impact socio-economic and political forms as well as the oft mentioned feeling of connection with the cosmos. It is through this that humanity can move away from space, as a frontier—a place to be conquered, but to space as an already existing part of the ecological system of which humanity already belongs.

Keywords

Space Exploration, Cosmic Orders, Coloniality, American History, Space Policy, Philosophy, Decolonial Theory, Chicana Feminist Theory, Marxism, Liberation, Anzaldúa, Dussel, Mignolo, Quijano, Epistemology.

Summary for Lay Audience

The outer space has long been considered the final frontier. But what does this metaphor bring with it into the future in space? I argue that the use of this metaphor signals that colonial practices are still present in American society and risk entering the future.

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Dedication

To the Moon.

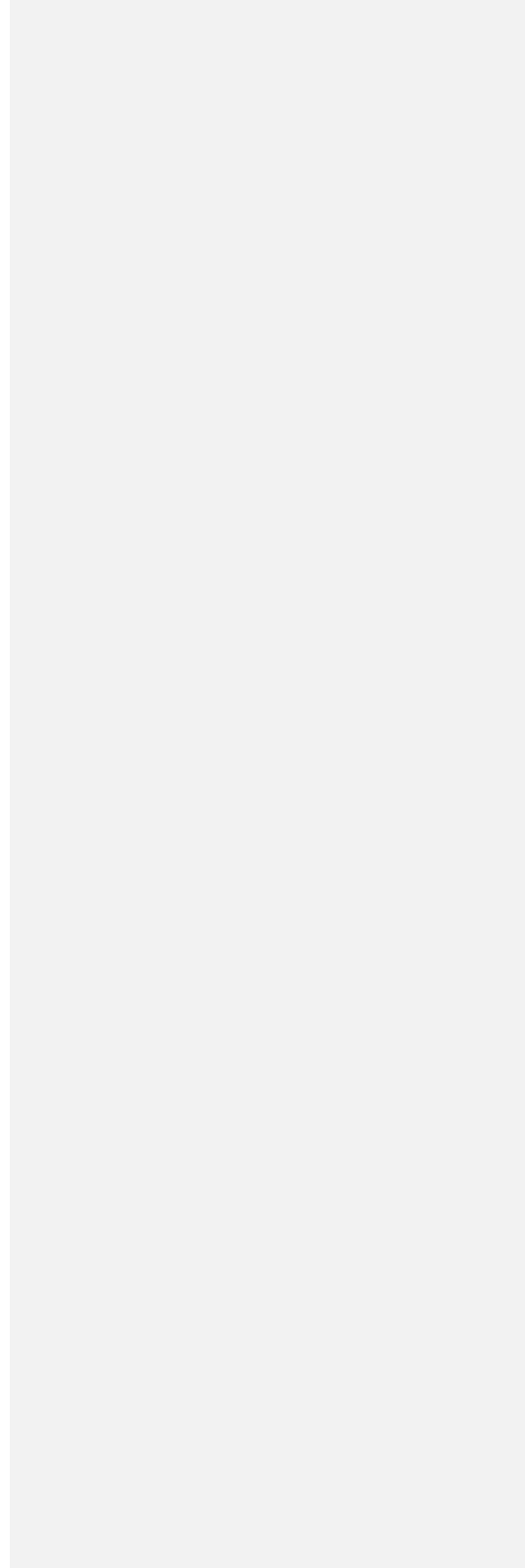


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Chapter 1: The American Cosmic Order

Love you to the Moon and Back.

In the Beginning

The “Final Frontier” is the Cosmic Order of Coloniality. The “Frontier,” the “Final Frontier,” the “New Frontier,” and the “Endless Frontier” are all oft-used analogies for outer space (Bainbridge, 2009b; Brown, 1978; Launius, 2004; Logsdon, 2019a; Michaud, 1986; Von Braun, 1952; Williamson, 1987). This cosmic order, hegemonically superior since the late 1960s even while losing popular and political power, arranges the very essence of Western space exploration, its future, and possibilities. The Final Frontier is a totalizing and finalizing conception of Man and his future. Such an order reduces ways of knowing and being to colonial and capitalist modes, where all things are reduced to exploitation. In this, the future of the Final Frontier hardly a future; it is a death march masked as salvation. Part of this appearance of salvation and actuality of death stems from the Puritan values that have endured in the American cultural landscape which have been transformed into its secular counterpart: Survival, the glorification of What Has Been, and death. This glorification of death is itself concealed by the valuation of control and power, and the expansion of the State and land. Although the Final Frontier as a cosmic order represents exploitation and control, this does not mean there is no Hope for a future. Although I examine how coloniality manifests in the American cosmic order in different forms (the values and norms of space advocates and the use of Frontierism in space policy and the public perceptions of the goals of space exploration), I hope to intimate another way, another future. The decolonization of the American narrative of space exploration represents a new path, and creates the conditions for a Cosmic Revolution, where awe and hope manifest a multitude of epistemologies and humanities. Space will not become a Frontier or a place to be conquered, but rather, an already existing and

integral part of the ecological system, space, and humanities. To theorize these things requires a detailed theoretical framework founded upon Anibal Quijano's theory of coloniality, notably the conceptions of humanity, brought together with anti-capitalist critiques of the economy and neoliberalism. By detailing the coloniality within the American cosmic order, what becomes obvious is that there are *las Rajaduras*, cracks in the appearance that reveal itself to be anti-life (Anzaldúa, 2000). In the end, it is in the work and word of Gloria Anzaldúa and the Zapatistas on the borderlands and the radical community that lie the foundation for a new world cosmic order, where imagination and reality are not limited to exploitation, and bloom with the possibilities of the universe.

This is not to say that the various analyses of the American venture into space, from the grandeur of the Frontier mythos to the realpolitik of Cold War, do not deeply investigate the conditions of space exploration (Arnould, 2014; Dickens, 2007, 2010; Dolman, 2002; Jenks, 1958; McCurdy, 1997; Sommariva, 2015; Valentine, 2012). The work of those historians, thinkers and theorists are much-needed accounts of the political and historical impact of the US space project. Yet none, save a few short articles here and there, have taken seriously the impact of colonial and imperial forms on space exploration. There is the work of Ray Williamson, who cautions against the continued use of the Frontier metaphor (Williamson, 1987). I am indebted to Williamson, because his critique of the Frontier metaphor served as the starting point of my dissertation. In her work, the historian Patricia Limerick analyzes the inadequacy of the Frontier metaphor as a historically inaccurate trope (Limerick, 1992). There are also Jane Young and Alan Marshall, who write, separately, of the imperialistic and anti-human aspects of space exploration (Marshall, 1995; M. J. Young, 1987). Recently, Ormrod and Dickens's sociological analysis of the impact of space on society offers a critical realist perspective on the humanization of space and what they call "cosmic narcissism" (Dickens, 2007). This is not to say that social scientists have only recently began

analyzing space exploration for its social and cultural properties. For example, the edited collection *Societal Impacts of Spaceflight* (2007) is full of a variety of social science analyses. There is also the work of the late, great anthropologist Ben Finney who wrote about the necessary social changes that would come from space exploration (Finney, 1992). There are also Dr. Linda Billings' critiques of the use of the Frontier as founded in conquest (Billings, 1997, 2006). Yet, none have analyzed the development of the space program and the visions of the future in space through a lens of anti-colonial, anti-capitalist critique.

Each decade has seen attempts at envisioning the future in space. Each embedding far more than just science and engineering principles, but also the political and social norms of their time. From Gerard O'Neill's L5 colonies of the 1970s to cities on Mars proposed by SpaceX owner Elon Musk ("Elon Musk Unveils Updated Mars Colonization Plan," 2017; O'Neill, 1977), space exploration is a haven for the imagination, but also for hegemony. The Final Frontier—the phrase made famous by Captain James T Kirk in the opening credits of the 1960s television series *Star Trek*—holds a sort of power that transcends metaphor. Of course, Captain Kirk was hardly the first or the last to associate space with the Frontier. Earlier references were made by former Nazi and NASA engineer Wernher von Braun. Earlier-even associations between space and colonization were made by John Wilkins when he wrote about venturing to the Moon with Columbus in 1638 (Wilkins, 1638). The Frontier of space and the Frontier of the West are held together by more than just metaphor, but by coloniality. Space, as it is conceptualized today in North America, cannot be removed from its relationship to American Western expansion. But more than just a metaphoric and narrative connection: these two places are linked by a variety of social, political, and cultural structures as conceptualized through the colonial matrix of power.

In *Epistemologies of the South*, decolonial theorist Boaventura de Sousa Santos states that the modern Western world is made up of a divided social reality: “the realm of this side of the line,” and the realm of “the other side of the line” (118). These lines produce a “subsystem of visible and invisible,” in which the invisible is the foundation for the visible; thus, de Sousa Santos attempts to elucidate the invisible aspects of modern Western thinking (119). In this same vein, coloniality describes the modern/colonial line, a line that fits with de Sousa Santos’s abyssal line. I am using the language of visible and invisible because I find that within the context of American space exploration, the visible and the invisible follow the colonial matrix of power. The visible Frontier conceals the invisible line of Modernity/Coloniality. As we move into this chapter, I plead for the re-evaluation of the justifications and motives that Americans use to understand space exploration and our place within the universe. My deepest desire is for the diverse and wonderful peoples of this planet to see and experience the vastness of outer space. I hope the will and weakness of coloniality does not set the material conditions and relations of those who dare to dream of a cosmic migration. After all, there is something revolutionary about space exploration. It holds the potential to transform humanity and the Western relationship with nature, with ourselves, with others. The normal operating procedure of Western Modernity will not function well in space, and thus the expansion of Earthly life into the solar system could mark a drastic change in the way in which we all live, work, and die.

In this dissertation, I analyze one of the fundamental ideas of a colonial and capitalist approach to space that I call the *Killian formula*: Exploitation = Exploration + Control. This simple yet powerful phrase was first used in a presidential memo in 1958 for presidential science advisor James Killian (Johnston, 1958). Contrary to this formula, I propose an alternative, not an opposite, way. In the words of Chicana feminist theorist Gloria Anzaldúa, I “leave the opposite bank,” and

pursue a different way (Anzaldúa, 1986). Understandably, this alternative cannot be produced without a full and rigorous analysis of the logic and violence of the current system.

If the image of the Frontier invokes images of outer space, it is also meant to conjure images of the American West. In the American imagination, the Frontier epitomizes both cowboys and spacemen, both American history and the American future. The connections between the “Age of Discovery”—the American West—and space exploration feature prominently in space advocacy, policy, and public discourse (Aldrin, 2004; Arnould, 2014; Bainbridge, 1976; Bell & Morris, 2009; Brown, 1978; Clarke, 1951; Davenport, 2018; Dick & Launius, 2007; "Elon Musk Unveils Updated Mars Colonization Plan," 2017; Foundation, 2019; Neal, 1994; Sadeh, 2002b; Von Braun, 1952; M. J. Young, 1987; Zubrin; & Wagner, 1996). From presidents to artists to journalists, the colonial connection is repeated time and time again. President Ronald Reagan’s reference to the analogy of the Golden Spike—the last spike driven to connect the transcontinental railroad to the test flight of the Space Shuttle in 1982—is not merely a rhetorical device, but also a symptom or sign of a wider colonial matrix of power. (McCurdy, 1997).

Indeed, Reagan’s reliance on the Frontier metaphor may be the most internally consistent of any US president. Yet, he was not the first president to use it. Famously, John F. Kennedy inspired the feverous dream of an American Moon landing with Frontier rhetoric (J. F. Kennedy, 1962). Yet, during the Reagan administration, The National Commission on Space, which included Dr. Gerard O’Neill and the first person on the Moon, Neil Armstrong, based on the priorities of the national space policy, entitled “Pioneering the Space Frontier” (1986). However, this reference to the Frontier went beyond just this work. Reagan referenced it repeatedly in his discussions on space matters (Logsdon, 2019a), such as the speech he gave after the *Challenger* disaster in which he describes the astronauts as pioneers (Krug, 1991) In this, the Frontier is a source of inspiration and

comfort. Clearly, the Frontier metaphor inspires both rhetoric and visions of the future. I will argue this is where the danger lies.

The image of the Western Frontier has not only inspired the rhetoric of politicians. The National Aeronautics and Space Administration (NASA) commissioned and funded a study by the American Academy of the Arts and Sciences that researched the impact of space exploration on society, which drew parallels between the railroad expansion of the 19th century and the space program (Mazlish, 1965). This study looked for parallels between the creation of the railroad infrastructure in the United States and the potential economic outcomes for the creation of the space-bound infrastructure (Mazlish, 1965). Evidently, the Frontier metaphor constrains which studies are conducted and legitimized, and directs funds towards these projects, which in turn shapes and limits the possible understandings of outer space and space exploration. While the political use of the Frontier metaphor may associate nationalism and value with the conquest of space, it also affects the very nature of how and what might be studied and proposed. Simply put, it *produces an epistemological reality*. Yet, this reliance on the Frontier for direction is repeated and reinforced as policy, memoranda, and advocacy. Outer space has yet to escape the Western Frontier.

The rhetorical use of the Frontier in policy and its directive power within institutions demonstrates an indisputable relation between Westward expansion and the venture into space. However, this relation is a complex set of relationships that arrange themselves in relations to norms, power, and nation-states, and transcend the political and social context of their contemporary setting and the bounds of international and historical relations and realities that follow the logic of coloniality. The references to the Frontier metaphor in space exploration policy, imagination, and public discourse indicates relationships to larger contexts and systems of coloniality, capitalism, racism, and patriarchy. Although space exploration functioned as a political

tool during the Cold War, the continued use of the Frontier metaphor emerges from a deeper set of historical as well as social and cultural conditions. I theorize that these references to the Frontier reflect conditions of coloniality. While appearing to operate as mere rhetoric and word play, the Frontier operates as an epistemological lens through which to understand the universe, humanity, and nature. I use the Frontier metaphor not because it fits the reality of the Western expansion or the actualities of space, but, rather, *because it fosters the same relationships that Americans have towards nature and humanity.*

To analyze the Final Frontier as America's defining social, cultural, and political relationship to the cosmos requires a form of theory that engages with coloniality and capitalism. The central theoretical framework of this dissertation is grounded in Anibal Quijano's concept of coloniality, which has been developed further by Enrique Dussel, Walter D. Mignolo, Nelson Maldonado-Torres, Arturo Escobar, and Ramon Grosfoguel. I bring all these thinkers together to analyze the coloniality of space exploration. Coloniality allows for a critical analysis that accounts for a multitude of relations, power dynamics and orientations. Furthermore, I will draw on the archaeo-astronomical work of E.C. Krupp and his studies of cosmic orders from various cultures around the world. As Krupp understands it, a cosmic order is a culture's organizational relationship with the cosmos that justifies and reaffirms that culture's internal structures and how it relates to the world and others. One's cultural relationship to the cosmos informs the knowledge of one's place in the universe (Krupp, 1983, 1997, 2015). Often, a culture's cosmic order will place that culture at the center of the world (Krupp, 1997), which garners it symbolic power. By aligning with the cosmos, cosmic phenomena and astronomical cycles are integrated into the culture, both in political and agricultural ways. Cosmic orders are a structural understanding of how the world works. In this sense, I understand the *Final Frontier as the American cosmic order*, because it is an organized worldview with

meaning and power attributed to certain relations with the sky. My work details those relations in order to find another worldview.

The Final Frontier contains cosmological American language that developed during the Space Age as a response to the United States' socio-economic and political conditions. Several theoretical components need to be considered, namely, the development of the American cosmic order and coloniality as it manifests in American culture and politics. Cosmic orders contain structures, such as conceptions of the Earth, cosmic power and empire, and the center of the world. These organizing principles are found again and again in ancient cosmic orders (Krupp, 1997). Coloniality dominates this American cosmic order and reinforces colonial cultural, social, political, and economic forms. While the social and political climate of space exploration changes over time from the rivalry of the Cold War to the contemporary Newspace structure, the Final Frontier remains the ruling cosmic order. More than just an American metaphor used to describe space, it is a way of understanding and creating visions of the future in space, and the very construction of reality, used by politicians and space advocates alike to justify the exploration of space.

Cosmic Americana

Although the variety of work on the historical, political, and social/cultural aspects of space exploration is vast and complex, the American Space Age is what springs to mind when space exploration is mentioned in the Global North. The rivalry between the United States and the USSR was an ideological war as much as a political one. Many analyses of space exploration, rocketry, and the development of aerospace technologies pay close attention to the context of the Cold War (Dolman, 2002; Launius, 2008; Logsdon, 2010; McDougall, 1985). American leadership in space was considered a necessary aspect of the anti-communist fight (Krug, 1991). While the Cold War raged, space exploration in the US found itself responding to the current political climate by way of space

exploration. The colonial connection was fostered through the use of the Frontier metaphor and its connection to nationalism. Since only the United States of America could lead the world into space, Manifest Destiny found its way to the stars.

Unlike the previous Frontiers that the United States had encountered (the Western Frontier and Alaska), outer space seemed to be the untainted and uninhabited wilderness that could have any social or political form written upon it. And it was imperative that those forms were American democracy and capitalism rather than communism. Between the pro-American rhetoric used by the government and the persuasiveness of Wernher von Braun's *Collier* articles, space exploration became an expression of the "American Spirit." The Manifest Destiny that took the US to the Western coast became a celestial destiny that could take us to the Moon through a series of relationships, assumptions, and historical and material conditions (Bellah, 1992). The representatives of the United States felt that it was the only country on Earth that could lead the world into space, because only America can venture into the unknown, into the deep, into the dark (Stephanson, 1996). Only America could colonize the *final* Final Frontier.

This story of the Frontier is what many space advocates, politicians and (other people) tell themselves and the rest of the world about the American space enterprise. It is a rousing idea because it uses nationalism as a political tactic. The American mythos was a way to tie the present to the past (Pace, 2014; Science and Astronautics, 1960). Based on Frederick Jackson Turner's "Frontier thesis," which states plainly that the United States' unique and ultimately righteous foundation derives from the pursuit of the Frontier (1960), advocates suggest that the closing of the Frontier signified an end to the American utopian experiment (Neal, 1994; Turner, 1960; Webb, 1952; Zubrin, 2002). During the ideological conflict of the Cold war, space helped to prove the validity of the American ideal and demonstrate that Frontiers are America's calling and

responsibility. In short, conquering the Frontier is the American mission. These stories—Manifest Destiny, the Final Frontier, beating the Russians—appeared as truthful, because they expressed and reflected a kind of a national common sense. As space exploration is a political project, advocates and politicians needed to draw on these hegemonic myths of Manifest Destiny and the Final Frontier to defend the United States' pursuit of space exploration against the threat of an expansionist Soviet Union. How all these elements come together requires a deeply interconnected and multi-faceted analysis. The Frontierism of the United States preceded the Cold War. Such an imaginary is profoundly colonial, and thus the structures that hold the inter-political and socio-economic aspects of space exploration together evidence coloniality. To understand what the cosmic order of the US empire is requires an investigation of the social, political, and economic relationships that produce this order. To reduce the American relationship to space with the rise of Modernity, technology, and interactions between nation-states, dismisses the history of the development of those things in relation to the acquisition of the Americas. To speak of the Final Frontier is to do so by linking visions of the past to visions of the future. While it may not be historically correct or sound, it is hegemonically significant (Limerick, 1992). The cosmology of the United States is that coloniality. Frontierism is the epistemological orientation of coloniality and the American Empire.

There have been many proposals for, and portrayals of, space colonization, such as the L5 colonies of Gerard O'Neill (1977), and the colonies designed by T.A. Heppinheimer (1977). Although these projects devote most of their attention to the engineering and design of these space colonies, it is undeniable that they represent a hegemonic, capitalist, and American social and political imaginary. While other thinkers focused on speculating the socio-political dynamics of such a venture, some thinkers use Fredrick Jackson Turner's Frontier thesis as a model of socio-political change in space (A. Kennedy, 2016). Others are interested in the biological and economic

ramifications of “physically diversifying” in space (A. Kennedy, 2016; Szocik, Lysenko-Ryba, Banas, & Mazur, 2016; Szocik et al., 2018; Torres, 2018). Others, such as James S.J. Schwartz and Tony Milligan, consider the ethics of space settlement and exploration (Milligan, 2015; Schwartz, 2018). And then, there are other thinkers who wonder at the imperial nature of space exploration and colonization (Billings, 2017; Marshall, 1995). All of these different perspectives and areas of interest contribute to a vastly diverse range of scholarship with competing views. Some thinkers that question the use of the Frontier, such as Linda Billings and Ray A. Williamson, cite the imperial ideological foundations of the Frontier metaphor (Billings, 1997, 2006; Williamson, 1987), whereas others embrace the Frontier as an inspirational model that motivates future action and exploration (Bainbridge, 2009b; Brown, 1978; Cruz, 2018; Davenport, 2018; Foundation, 2019; Heppenheimer, 1977; O'Neill, 1977; Taylor, 1974; Zubrin, 2002; R. Zubrin, 1999; Zubrin, & Wagner, 1996).

The history of cosmic orders, of human spaceflight, and of the vision of a future in space is varied and complex. From the early works of Tsiolkovsky and Goddard to the clever and ambiguous designs of Von Braun, space exploration has captured the minds of millions. Although those numbers wax and wane, the pursuit of the future in space is held dear. Perhaps we cling to the utopic dream of a better world because that world can represent something remarkably different to our own. Often when writing about space exploration, thinkers and advocates reduce humanity to a monolith, as though we are all a homogenous and harmonious blob. These same thinkers and advocates assume the “benefits” of space exploration will be distributed equally. For instance, the phrase “For the benefit of all mankind,” which first appears in the pamphlet “Introduction to Outer Space” by the President’s Science Advisory Committee with a short introduction by Eisenhower, implies that American space exploration will improve the living conditions of the entire human species. Eisenhower stressed the peacefulness of the American space program and stated that the science and technology that would result from such a program would serve and benefit “all

mankind” (Eisenhower, 1958). This phrase, as well as “to go where no one has gone before,” came from this document and has been used in relation to space (in both reality and fiction) ever since. Immediately, these beneficial aspirations contradicted Killian’s interest in national defence and national prestige as fundamental reasons for space exploration. This contradiction—between “peace”/“benefits” and defence—remains unresolved because most Space Law professionals and space advocates routinely fail to question or challenge the political or social climates in which these rationales are created.

As I demonstrate in this section, the rhetorical habits and tropes of these advocates are squarely centred in the Western experience. They are drenched in the worship of technology, individualism, the bootstrap mentality, and colonial ambitions. The motivations for space are mere extensions of the logic of capital and the continuation of coloniality. Despite their relative importance, the political forces that drove the development of NASA—a product of the Cold War—are only partial aspects of space exploration. Any attempt to connect the development of space technologies, human spaceflight, and those visions of the future to the legacies of colonialism may initially seem both obvious and ridiculous. The first and most common objection to this connection is that “there are no peoples in space to colonize.” This is an acceptable objection only if it was a confirmed fact that there are no other lifeforms in space. Regardless of what happened at Roswell, the existence of extra-terrestrial life remains a matter of speculation and uncertainty. Additionally, this common objection fails to address numerous other aspects of colonialization, such as the epistemological impact of coloniality on the populations of colonial powers.

As soon as one analyzes the work of space advocates, policy makers and politicians, it becomes obvious that the Final Frontier trope is never invoked without a political and social rationale (Glenn & Robinson, 1980; Hardersen, 1997; Krug, 1991; Pace, 2014; Taylor, 1974).

Although the wondrous and inspirational dimensions of space exploration often earn a perfunctory reference, it is never disassociated from the political order. Regardless of the changes to the social and political forms, the use stays constant. The world of the 1950s may be radically different from the 1980s and contemporary times, yet the Frontier remains the favoured metaphor of choice for space policy. The repetitive use of the Frontier in space policy and advocacy motions towards something deeper than mere metaphor. This is why it is necessary to examine how and why Krupp's theory of the cosmic order is not, as could be argued, an aspect of ancient civilizations, but an ongoing order of the relationship that any culture or society has with the heavens, regardless of access or sight. For instance, Gerrard O'Neill's "The High Frontier" published in the 1970s reflected a future in space that mirrored the social conditions of middle America. The future was simply the status quo projected into the following years. Similarly, the repeated use of the metaphor of the "Final Frontier" denotes a relationship to space that is more than one of curiosity. Politicians, space advocates and the public understand space in relation to themselves and their communities. The Final Frontier not just a metaphor that exists without the relation to the America West is the structure by which a relationship to space is forged in the American context. As Americans, we cannot fathom space without the myth of the Western Frontier. In contrast, space is not the Final Frontier for non-Western cultures. In interrogating "the Final Frontier," the structures, norms, and assumptions that the phrase produces with regard to space appear as more than just American nationalism and pride, but manifests as an aspect of coloniality, such authority and the shared power relations between economics and nature. Indeed, the Final Frontier the future of coloniality. Yet, the primary form of political analysis of space exploration is that of impact of the cold war. To analyze space exploration as an aspect of continued coloniality is not to denounce or discredit these accounts, but, rather, to bring out the implications of American space exploration within the more pervasive and global political and social forces of imperialism and colonialism.

This is not to say that the use of the “Final Frontier” is an intentional or conspiratorial link to the colonial matrix of power. It is, however, associated with American hegemony and its colonial past. The relationship of power, technology and nation-state produces the conception of space as a mirror for small- and large-scale patterns of American power. Power in a cosmic order often comes from religious association, often through the mythos of sky power bestowed onto a leader (Krupp, 1997). The American cosmic order, as I demonstrate in my third chapter, is not wholly secular. The religious aspect of the Final Frontier has transformed over time, but many of the fundamental assumptions are still present in justifications for exploration.

My research, on the other hand, illuminates the interplay between colonialism and coloniality, the American vision of itself and future, Puritanism, patriarchal-capitalist state formations, and the cosmic order of the American empire (as a cosmic justification and reflection of American values), and contextually formed political reactions. I hope to demonstrate that the history of space exploration in the United States, and the visions of the future that it generates, are not mere reflections and reactions to the social and political context of their times but are also reflections and formations of coloniality. For example, “the von Braun paradigm,” coined by Dwayne Day, is more than just von Braun’s vision for American space exploration. It functions as a vision of the future that embeds and reinforces various aspects of coloniality. The design of this possible future contains assumptions about political and social norms and the state of nature. These assumptions reveal the capitalist-patriarchal norms that perpetuate, not just von Braun’s thinking, but so much of the thought, policy, and work about space exploration.

Yet, it is not von Braun that wrote one of the most revealing documents I have found. The *Preliminary Observations on the Organization for the Exploitation of Outer Space* (1958) contains the very simple yet powerful formula: to exploit space, there must be exploration of it and control of it. This

is true for the exploitation of all things. The intended form of exploitation that could occur in space, and other celestial bodies, varies. A definition of exploitation, related to nature and space, will be cultivated in this work. There are many ideas of what could happen in space from human colonies to the resource exploitation of the asteroids (Bignami, 2016; I A Crawford, 1995; Davenport, 2018; Dickens, 2009; Elias, 1990; "Elon Musk Unveils Updated Mars Colonization Plan," 2017). Much has changed regarding the use and control of outer space since the rise of private space companies (Davenport, 2018). Currently, the United Nations Outer Space treaty forbids any national claims to the Moon or other bodies (Nations, 1967). Whether this treaty will be honored remains uncertain. The recent creation of the American Space Force suggests that it may not be long before the conditions of the treaty are violated.

Even when these visions attempt to stay “neutral” in theorizing about governance and social norms, they tend to conform to Eurocentric conceptions. The future is built on coloniality because these visions of the future are not critical of their points of imagination, but, rather, enclosed in them. This is obvious in the Stanford/JPL design study on space settlements conducted in 1976. The variety of social forms possible for a space settlement were reduced to three, which were familiar to Western cultures (FFPiESD, 195). This is what happens when “neutrality” is not interrogated. As I show in this work, “neutral” in the space community is often hegemonically Western and patriarchal.

The problem that I began to wrestle with was that of the use of “frontier” in space exploration rhetoric. I began to wonder at the colonial language and whether or not it was simply metaphor. American space discourse, policy, and visions of the future cannot seem to get away from the frontier. This work is an exploration of what the reason this may be. After all, the frontier is an almost constant metaphor used for space even during massively different political and social

conditions (Bainbridge, 2009b; Billings, 1997; Brown, 1978; deGrasse, 2005; Foundation, 2019; Hardersen, 1997; Kearnes & van Dooren, 2017; Launius, 2004; Limerick, 1992; Logsdon, 2019a; McCurdy, 1997; O'Neill, 1977; Sterling Saletta & Orrman-Rossiter, 2018; United States. National Commission on, 1986; Von Braun, 1952; Zubrin, 2002). As a theoretician, I began this search by making my way through space-related disciplines, such as geography, history, policy, political science, and ecology. While there was a great deal of literature on American space exploration, none of these disciplines sought to understand the colonial conditions of American history and how the logic of coloniality may explain the use of the frontier. Given that until recently, the United States government controlled and mandated all spaceflight related to the US, I decided to review American space policy and all available internal documents related to the creation of NASA. I looked for the use of the frontier and any other western or colonial metaphor, such as Columbus (Neal, 1994). What I found was that the use of the frontier metaphor was often used as a rhetorical device to conceal a relation of exploitation. This relation of exploitation mirrors the production of the capitalist relation towards colonized peoples and lands from the beginning of the colonial period. Because of this, I expanded my search of American space documents to include those documents whose purpose was the justification of exploitation. It is through this back and forth, between theory and policy, that I was able to find the disciplines and theoretical frames that illuminated the exploitative nature of space policy and its connection to the colonial history of the US.

The theoretical perspectives of this work tend to fall within the decolonial theory—I mostly reference theorists from South America and the Caribbean, with a notable inclusion of de Sousa Santos, who hails from Portugal, although through the course of this work, the anticolonial nature of his work, even if situated in the global north like Mignolo, Grosfoguel and Anzaldúa, comes from a borderland within the north. Notably absent from my work is postcolonial theory, a branch of postmodernism that arose during and after the revolutionary period which saw the end of colonial

administrations around the world. These theories are cultural and population centric in nature (Gandhi, 2019; Lazarus, 2011; Loomba, 2005; Spivak, 2010). In engaging with decolonial theories of coloniality, of liberation, of “war” and their critiques of capitalism, my work can hold a more radical, liberatory edge. Postcolonial theory often theorizes the impact of the nation-states on peoples, renders cultures and nations static rather than dynamic and does not question some of the most hegemonic modes of epistemic injustice. Postcolonial theory is about peoples and identities, while decolonial theory is about *governance, knowledge, and power* (Bhambra, 2014; E. Dussel, 2013; Grosfoguel, 2008). These categories then include nature and non-sentient beings, and this mode of thinking can extend into space in a way that a critique only focused on colonialism cannot. A post-colonial critique of space exploration is limited to interactions between living being, whereas decolonial critiques tend to examine the logic behind relations.

Decolonial theory, especially the framework of the colonial matrix of power accounts for, and encourages an understanding of the world as holistic, unlike disciplinary divides that force a thinker to produce an account of a phenomena through an interdisciplinary route, decolonial theory already accounts for interconnectedness. This means that ecological, political, and social forms are already considered part of any other form of analysis.

Admittedly, I cannot completely imagine my own vision of the future. This is not due to a lack of creativity, but, rather, due to an immense respect for the processes of world- and life-building. I theorize that we need more than concrete technological plans or visions of a whole (or fragmented) society to serve as guiding principles of the transition into space. No one person can imagine such a place or all the intricacies of the future worlds or all the changes that may occur. I do not pretend to know what the future will look like. We cannot know. What are the only reliable principles that can offer a speculative glimpse into the future in space? It is that the environment and the material conditions (systems, structures, social and technological forms) all impact each

other. Life in space will be a unique arrangement, not just on a possible colony, but on all planetary and celestial bodies.

“Love is Never Idle”

Unlike most points of interest, space is both distant and immanent. Although “outer space” is distant from a human being on Earth, its presence is overwhelming. This is true for me in the most heartfelt manner. William Sims Bainbridge’s theory of cosmic fascination and the development of the space industry states that the pioneers of space exploration fell in love with space at a young age, and implies that this devotion to space is the motivating factor in the lives and work of men like von Braun, Clarke, and Goddard (Bainbridge, 1976). The risk of accepting the normalized violence of coloniality as part of space exploration is acceptance of an exclusionary understanding of humanity and with it, a reductionist view of nature. This is not unlike von Braun who distanced himself from the moral responsibilities of the forced labour that built the V-2 (Neufeld, 2007, 2008). Too often, cosmic fascination has overlooked the price of the blood of others.

Bainbridge’s idea that fascination of space exploration was the central motivator for early rocket and engineering marvels falls flat when analyzed through the colonial matrix of power. I do not question love of space as motivation; yet the manifestation of this love is frequently implicated in the belief that the current political and social systems are unchanging and unchangeable. Given the Nation-State and order of the world during the twentieth century, the only way to space was through hegemonic constructions of the world. Reading cultural and political analysis of space exploration has left me with utter disillusionment. I have a deep love for space, yet the idea of space itself is saturated with so many facets of the social, cultural, and political. The mere utterance of the metaphor “Frontier” or “Final Frontier” invokes compound images of the Moon, Mars, and far-off places as well as the American West, cowboys, and rough riders. If love is the central aspect of the

space community and industry, then why is it complicit in so much violence? The Frontier is not an expression of love; the Frontier is an orientation of exploitation. As Limerick states, such (Frontier) imaginary is not based in historical reality, because it is a cultural fiction bound to nationalism and the acceptable violence of the Nation-state. I want humanity to go into space. I want to see what is possible in this universe with this life. But to do so, we, as humans, cannot treat space as an extension of Modernity/Coloniality. It should not function as an Outside for conquest. This work is indeed a critique, but it is also a love letter. I confess that I am not a poet. Although I cannot string words together to produce an image of cosmic love, I can reveal *las Rajaduras*, those cracks in the Modernity/Coloniality matrix, that reveal another future. I am no scientist, no engineer, no entrepreneur. I have no material contributions to give outer space, but I do have the courage to critique and advocate for another way. I can offer a Cosmic Hope: a hope that does not carry structural violence, but the awe of the cosmos that so many of us feel.

The world is far too complex to state with conviction that things are this or that. I do not intend to proclaim boldly that this Final Frontier is America's only relationship to space exploration. Yet, the Final Frontier reveals a hegemonic relationship to space bound to coloniality reinforced through space policy, advocacy, and popular culture. This is the most prominent cosmic order, but it is not the only one. Initially, I thought that this thesis would highlight the links between colonial policy and SETI rhetoric, but I slowly realized that it would be superficial to point out these links without critique the role of coloniality in space policy and advocacy as a whole. When I was a young girl, I would look at the chaos of the world around me and fear that that chaos would be extended into space. I did not know the complexities of the world, of the nation-state, and those of competing ideologies over resources and their allocation. To keep the universe "safe" from humankind was a simple wish of a poor girl. Yet, that simple wish has become the central motivation of my entire life. As I passed through the stages of my education, I came to understand

the complex formations and discursive ways of the world. The obvious links between Western colonization and the ways in which many politicians and space advocates speak about the venture into space became impossible to ignore. There was a point at which self-reflection forced me to confront that which is colonial in myself. Did I love space because of the hegemonic narrative of colonialism and national destiny that is so thoroughly saturated in the United States? Was my love of space nothing more than an imperial impulse?

Regardless of their flags and formal declarations, the West does not own the sky. It was this insight that led me to study the anthropological work on cosmologies and cosmic orders across the world. I started to understand that cultures had/have a way of relating to the space, in which the cosmos was integrated into their culture. I hope that this thesis reveals how the cosmic order of the United States is embedded with coloniality. These socio-economic norms produce a future in space that is chillingly similar to the horrors of colonization. The stories we tell ourselves about The West whitewash the blood of the indigenous peoples of the Americas. Yet, so many are so quick to say, "There are no Indians in space,"(Williamson, 1987) as though colonization only had one form and one effect. Those of us in the West are the most colonized because our minds are clouded by imperial dreams masked as innocent exploration. Do we seek space for space's sake? For the aesthetic experience? Or for the profit, the resources, the power, and prestige? When Western minds that turn their eyes towards the sky, I wonder whether the aesthetic experience is the source of that wonder. Unfortunately, hegemonic institutions force us to rationalize that wonder into forms that are compatible with the constraints of colonial rationality. Current material conditions force us to know the universe solely through the lens of coloniality and consumption, even though it is a mediated experience of the universe. To accept this mediation as objective truth is to mistake the smudge on one's glasses for an aspect of reality, rather than the obfuscation of it. This work, this blood on paper, is my love letter to the Moon. I seek a different path that does not limit the future

to the errors and blood of the past. It is a path that walks away from this past into a universe with multiple futures. Simply put, it will lead to a universe where many universes are possible.

In an early essay on man's place in the universe, Konstantin Tsiolkovsky explains his "Cosmic Philosophy" and writes: "Reproduction of the imperfection should be stopped." Tsiolkovsky states that this "imperfection" is the pessimistic outlook humans have about themselves and the isolation of the world from space (Tsiolkovsky, 1934). While Tsiolkovsky believed that the destiny of man was linked to the destiny of atoms and of the universe, I agree with his conviction that we should cease the reproduction of the imperfections, that is, the violence of coloniality.

The Map

Beginning with the major theoretical elements the following chapter of this work is split into three parts. First, Anibal Quijano's colonial matrix of power (CMP) is offered as a full critique of Modernity and eurocentrism, and I discuss the notions of liberation that decolonial theorists have proposed as alternatives. Coloniality is "a complex structure of management and control composed of domain, levels, and flows. ...it helps make visible what is invisible..." (Mignolo, OD, 142)." For Quijano and other decolonial theorists, the CMP consists of Economy (of which nature is a part), "knowledge and subjectivity," "race/gender/sexuality," and "authority" (Quijano, 2000). I use decolonial theory to analyze Eurocentric conceptions of Human/Man, of Nature as Resource, and the innate hierarchy of the world system, and thus illuminate the Eurocentric assumptions within space discourse. The claims to universal definitions on the part of space elites re-inscribes conditions of coloniality upon space and the future. As these definitions do not encompass all peoples or ways of relating to the Earth, they hold universal power only because of historical genocide and epistemicide.

The second section examines Krupp's theory of cosmic orders as the way that societies have historically produced an understanding of the cosmos and their relationship to it. According to Krupp, cosmic orders justify political and social forms and relationships between peoples, nations, and ways of life. Cosmic Orders regulate the very idea of what is it to be a good human according to that culture (Wynter, 2003), and legitimates the relationship that a culture has with nature. Dickens and Ormrod raise this point in their work on Cosmic Societies and compare Krupp's cosmic orders with Lefevre's production of space. I use Dickens and Ormrod's conceptualization of the Great Chain of Being to demonstrate the connection between ancient comic orders and the production of the American order. Finally, in the third section I look at the development of American culture from its Puritan roots, the secularization of some Puritan values, and how those cultural elements help produce Frontierism. Puritan values find their way into space rhetoric repeatedly during different eras of space exploration. The limited Eurocentric conception of Human/Man and nature, and the Puritan narratives about the New World shape and constrain the United States' relationship to outer space as one of consumption and conquest regardless of justification.

The third chapter—The Final Frontier—is an analysis of the historical-hegemonic development of the Final Frontier as a cosmic order. This chapter focuses on how coloniality permeates the American Cosmic Order through its various forms, especially the exploitative relationship to nature and the limiting definition of Human/Man. Moving beyond an analysis of actors and contextual political motives, this chapter looks at how space advocates talk about space and what that reveals about their understanding of reality. I also divide this chapter into three parts. First, I outline the most rhetorically impactful idea on space exploration as the Frontier thesis. I examine how the Frontier thesis reaffirms the colonial conception of Human/Man and the reduction of nature to use-value. Second, I investigate how space advocates use the Frontier thesis within their advocacy and draw out the coloniality within it. By celebrating the Frontier thesis and

proclaiming space as the new Frontier, advocates celebrate the inherent violence of Modernity/Coloniality. I also detail how space advocates engage with their contemporary times while still reaffirming coloniality. Third, I show how this use is an invalid universalism produces a future that is limited in its epistemological and ontological possibilities. In this, the Final Frontier as cosmic order binds the future to the past through a repeating logic of exploitation. From O'Neill's L5 colonies to Elon Musk's vision of a city on Mars, visions of the future contain aspects of colonial matrix of power.

The fourth chapter focuses on the American cosmic order as it has developed through American Space policy with a case study of the von Braun paradigm as the exemplar of colonial conditions. This chapter is structured according to the Killian Formula: Exploitation = Exploration + Control. This is a formula that Paul S. Johnston wrote in a memorandum in 1957 (Johnston, 1958) that expresses—unintentionally—the essence of coloniality: exploitation as the core relationship between Human/Man and Nature (as Resource). With coloniality, it is more than just the acquisition of land and peoples, but the changing and control of ways of knowing and being in the world and the solar system. Such an orientation overly determines what “humanity” is—conquer/ers—and the purpose of Nature. I examine how this formula manifests differently in American space policy, speeches, and memos from the 1950s to the 2000s. Often, the use of Frontier metaphor signifies exploitation. From Dwight Eisenhower to Barack Obama (and Donald Trump), the exploitative conditions of the Final Frontier are enforced and reinforced.

The fifth chapter is part of a speculative project of proposing and producing alternative relationships to the cosmos. I theorize that there is an emotional-aesthetic aspect to the human engagement with the cosmos. Although this experience has often needed to express itself through oppressive and exploitative systems, it remains a relatively untapped source of inspiration and

invention. I call this emotional-aesthetic appreciation of the cosmos *Cosmic Awe*. Cosmic Awe is a source for imagination. Since Awe alone is subject to material conditions, I theorize Cosmic Revolution as the potential reorganization of socio-economic and political forms within the harsh environment of space. Individualistic and destructive relations pose far too much of a threat to existence. New practices, beliefs, and institutions will form as an adaptation to the environment of outer space. Consequently, the critiques of coloniality will allow for the possibility of a multitude of epistemologies and ontologies. Finally, I expand upon Ernst Bloch's *Hope* (1996) and Gloria Anzaldúa's *Borderland* (1986) to argue that this future reality will be fluid and flexible, and resistant to the imperatives and injunctions of coloniality. Cosmic Hope is the celebration of the vastness of the unknown that embraces the various possibilities of an alien and unpredictable future. The constellation of these three ideas intimate a highly changeable cosmic order in which many cosmic orders can exist together without the violence of the totalizing cosmic order of coloniality. This cosmic order is life-affirming, cyclical and adaptable, whereas the cosmic order of coloniality which orientated towards death.

In my conclusion, I consider the repetitiveness of the aspirational discourse surrounding space exploration, and I argue that this is trapped within colonial imagery. In the end, outer space could hold endless potential and possibilities. But if there is only one epistemological orientation, that of exploitation, the only possibility is the suffocation of the universe. Under the conditions of capitalism and coloniality, how much Cosmic Awe can be understood and expressed? Contrary to the cosmic order of coloniality, the aesthetic experience of Cosmic awe offers breath to endless possible futures. I entrust my future to the futures of Cosmic Awe and Cosmic Revolution.

Conclusion

In the words of controversial American Indian Movement member Russel Means, the space program exists “in order to colonize and exploit the planets the same as the Europeans colonized and exploited this hemisphere” (1983, p. 27). According to the American policy makers and NASA administrators, the space advocates, and the general public, we venture into space to colonize and exploit. Yet, this is not a future. This is a continuation of the past and present. Given the drastic change in the material conditions, the future in space provides an opportunity to change social forms, cultural norms, and political institutions. This is only going to be a possibility if we do theorize the necessary conditions of a future in space—without the metaphor of a historical disaster—from the standpoint of the very real and revolutionary thinking of those who understand best the conditions of coloniality. Astrophysicist Neil DeGrasse Tyson, speaking on the late President Kennedy’s famous Moon speech, said “If you hear that, you say, ‘By gosh, America is about exploration. We are about the exploration of space.’ That is the next Frontier—just like the Columbus voyages and all the great explorers of the fifteenth century. Our next new ocean is space” (deGrasse, 2005). The American cosmic order is founded upon the very idea that Human/Man is a conqueror, and that exploration is a necessary step in conquest. The Human/Man that Tyson discusses is a colonial man trapped within the conditions of coloniality and capitalism. Coloniality disfigures the Human/Man just as it disfigures and exterminates those people it exploits. Yet, I am afraid that the Human/Man does not know his chains.

Like Zubrin, von Braun and many others who about the benefits of lunar exploration, Aaron Cohen, Director of the JFK Space Center, simply repeated what many others have said: “In that time, of course, the great Indian horse cultures of the Plains disappeared, and by the end of the 19th century the American Frontier had passed into history. That sense of Frontier, of elbow room and exploration, has for two centuries now been fundamental to the American psyche, to our ideas

of ourselves and our national culture” (Cohen, 1992). Cohen portrays the genocidal practices of those explorers as incidental yet inevitable, and reaffirms the assumption that Americans benefit from colonial expansion. Although the common objection that “there are no Indians in outer space” serves to justify the revival of the “Frontier” spirit in space policy, it repeatedly fails to account for internal violence, for future violence and for the possibilities of developing other ways of being. It is a pessimistic way of understanding human potential.

This repetitiveness of colonial imaginary can be understood as both violence and a lack of imagination. The possibilities of space exploration are endless, yet American space exploration is trapped in its own violence, its own lack of epistemological diversity. The colonial imaginary of the Frontier may be inspirational, but it is a sore historical wound. Frontierism in space leads only to exploitation and destruction, internal and external. It is not simply a matter of dropping the metaphor, because the structure, practice and meaning of space exploration is one of exploitation. The Frontier is only a fitting metaphor because it functions as the appearance of coloniality. The Cosmos does not belong to any person or culture as all cultures have a cosmology and a way of understanding themselves in relation to the whole of the universe. The orientation of the American Cosmic Order consumes the whole universe and excludes other ways of relating or being. What “we” risk in the lack of imagination—in the lack of decolonial imagination—is a future in space that is a sterile euro-centric technological dependent community that reinforces the matrix of coloniality as it attempts to exploit the space environment and reinforces systems of violence upon peoples on the Earth and elsewhere. By ignoring the violence of the systems by which space exploration is made possible we re-enact von Braun’s acceptance of forced labour. The violence of coloniality is normalized, accepted to the point where it is not seen as violence, in this the “peaceful purposes” of space hold this violence, and bring it into the future.

Chapter 2: Coloniality and Cosmos

For the Benefit of All Mankind

Coloniality has entrapped the imagination of Modernity. As such, the future is hardly a future; it is the reproduction of norms, systems, and myths of a history of ignored or hidden oppression. The cosmic order of Modernity/Coloniality separates nature from humanity and produces an exclusionary conception of “humanity.” All relations are reducible to relations of exploitation, and the heavens are used to legitimize this. These norms and systems are not neutral as propagandized, nor is Modernity an unending celebration of uplifting humanity. On the contrary, it is the uneven world order of exploitation. Traces of this exploitation are articulated—explicitly or indirectly—in the words, pages, and ships of space policy and advocacy, often in a patriotic and celebratory scientific manner. The very structure of the American cosmic order is bound to oppression and exploitation. The exploitation of the world, of the stars is neither final nor predestined, regardless of the American rhetoric. Within the might of Modernity, of the history of epistemicide, of oppression and death, there are *Las Rajaduras*, or cracks, in the appearance of Modernity. To see these cracks, we must fully examine the legacy of Modernity/Coloniality. Coloniality is not fundamental or intrinsic to all cosmic orders. Yet, it is constitutive of the American cosmic order because the history and narrative of the United States is characterized by coloniality and capitalism. One of the deadliest aspects of Modernity is the set of hegemonic assumptions that permeate all aspects of American space exploration, which limits the imagination of space exploration. The normative language of policy, both American and that of the international community, reaffirms assumptions that are rooted in coloniality, specifically the conceptions of “Humankind,” “Peace,” “Nature,” and economic relations. These concepts hold the future hostage to the past, to the exploitative systems of the present and past. The What Has Been, the Eurocentric assumptions of Modernity, needs interrogation and dismantlement. By not rooting out coloniality

from space exploration, space exploration will always be space exploitation of humans and nature. This cosmic order will never be a set of relations bound with hope and awe but, rather, will be a set of Eurocentric ontological and epistemological forms shackled to their essential exploitation.

The celebratory narrative of Western Modernity is so pervasive that it needs no retelling. What is left out of this triumphant narrative is coloniality—that necessary, yet invisible, “dark side”—which underpinned the rational, technological, and “democratic” achievements of Modernity. This section will illuminate the dark structures and institutions of coloniality behind the dazzling glow of Modernity. As a result, the aspects of coloniality that are integral to space exploration will become recognizable. As Mignolo states, “Coloniality names the underlying logic of the foundation and unfolding of western civilization from the Renaissance to today, of which historical colonialisms have a constitutive, although downplayed, dimension” (Mignolo, 2011). Consequently, coloniality is a fundamental part of Western Modernity, within the exploitation, of peoples and the natural world, of the Americas, Africa, and Asia, without which the modern world system would not exist. Yet, coloniality—as a logic—is a socio-economic, political, and cultural structure that began with colonialism and continues to this day. This logic produces ways of being and thinking that are exclusive or exclusionary, rendering conceptions of humanity, gender and race, knowledge, authority, and nature that reinforce colonial norms and capitalist futures.

In the words of Maldonado-Torres, “Western Modernity not only became entangled with the production of coloniality, but was itself constituted by coloniality” (Maldonado-Torres, 2016). The philosophical values (including the scientific method), technological achievements, and secular governance are only one half of Modernity; the other half, the dark side, is the genocide, the epistemicide, the expansion of European patriarchal norms to the rest of the world, the development of racism, and the capitalist system. Neither can exist—in their current forms—

without the other. Simply put, Modernity is the “emancipating will and genocidal violence” (de Sousa Santos, 2014). Modernity foregrounds European or North American socio-cultural and economic norms as universal, which assumes that all humans use and understand or can understand these norms, which displays the myths of Modernity, such as emancipation, rationality, and secularization. De Sousa Santos explains that Modernity is based on social regulation and social emancipation, which, in turn, constitutes the nation-state, the (capitalist) market, and rationality, including instrumental rationality (science and technology), as well as ethical practices (de Sousa Santos, 2014). If this is Modernity, then coloniality continued this logic of oppressing practices in the Americas, Africa, and Asia by destroying other socio-cultural and economic forms and relations. These genocidal practices were essential for the emancipatory aspects of Modernity that manifested in Europe and later North America (i.e., scientific and political revolutions).

Against this background, I investigate the conditions of coloniality to reveal their form and function within American space exploration, policy, and justifications. As examined later in this work, *colonial imagery* of coloniality in American space exploration are evident. The Frontier and coded phrases of “peaceful purposes” and “benefit of all mankind” have no real meaning or power beyond hegemonic use-value. And so, it is necessary to examine the hegemonic logic of Modernity/Coloniality to understand how these signposts shape, constrain, and determine the dominant forms of space exploration. The continued Modernity/Coloniality world system abstracts humanity and subjectivity, then categorizes humanness in Eurocentric terms. Although space policymakers and advocates alike proclaim that space exploration will be beneficial “for all mankind,” those benefits are seldom distributed beyond the American settler nation-state or its European allies. The Modernity/Coloniality world system normalizes dehumanization and “war,” as Maldonado-Torres explains, through the normalization of exploitation and violence that become

accepted and expected to be an aspect of governance and the economy. In this, “peaceful purposes” affirms capitalist and state violence as “peace” (Maldonado-Torres, 2020).

Yet, it is necessary to understand cosmic orders or socio-cultural cosmologies before it is possible to fully comprehend the relationship between coloniality and space. According to the archaeo-astronomer E.C. Krupp, ancient civilizations organized themselves in relation to the cosmos. This organization reflects and historically justifies governance and socio-cultural norms. As Krupp states, “the way people look at the universe has a lot to do with how they behave” (Krupp, 2015, p. 1). This dialectical pattern creates a unique, culturally specific, cosmic order reflected in political organization, religious structure, and ritual (Krupp, 1997). A cosmic order, or cosmovision, is the worldview that frames cultural, social, and/or political relations within a given culture in terms of how that culture understands the cosmos. Cosmic orders do not only reflect internal social and political structures, but also govern how a culture relates to other cultures. Some cultures have conflicting theories of the cosmos, rival creation stories, or visions of the universe (Blacker, 1975). Although it may be tempting to believe that cosmic orders belong to the superstitious or unscientific social orders of the past, contemporary North American cultural hegemony also requires a cosmic order to understand its relation to the universe, which has evolved from the myth of Europe, Puritanism, and the material conditions of colonization and capitalism in the North American continent. Although administrative colonization may have ended, the socio-cultural and economic changes caused by it—coloniality—shape political forces across a global context. Capitalism—the descendant of colonization—is the economic world system, and both coloniality and capitalism are based on cosmological assumptions. Coloniality is a constitutive part of the American cosmic order, as this cosmic order reinforces modes of exploitation that follow the logic of coloniality and connects conceptions of space to this order.

Cosmic orders reflect and reinforce the conditions of a culture (Dickens, 2007). Consequently, cosmic orders regulate and ascribe meaning to relations through power and status conveyed through symbolism, ritual, or astronomical predictions (Krupp, 1983, 1997). Not only does it dictate societal structures, but also constitutes the very essence of what it is to be human to that culture. Significantly, the arrangement of internally-produced characteristics as “human” allows for a cultural specific set of characteristics to be deemed universal through way of colonization (Wynter, 2003). I will expand on this point later in the chapter.

Under the hegemony of Western Modernity, power is bound to colonial and capitalist structures. Cosmic power means that the sky has to have a place within this system. Yet, if cosmic power must be secular under conditions of Modernity, how does this power manifest? This cosmic power derives from the ability to understand the cycles and patterns of the sky (Krupp, 1983, 1997). Cosmic orders are constantly reinforced through community identification and invested with authority through specialized knowledge of the sky. Cosmic meaning—written in the sky—is attributed to a community ideology that functions as a binding for internal relations and external boundaries. Although these ideologies are different for each culture throughout time, some common structural patterns are discernable. The cosmic order of ancient Egypt with *Maat* and the divine order of kings, whose priesthood oversaw this system, may be vastly different from the European medieval “Great Chain of Being” (which ranked the hierarchy of creatures from God to rocks) (Dickens, 2007), yet both hierarchies regulated by the religious order of that culture.

Although these forms of cosmic power may seem distant from, and distinct to, “our” scientific rational, objective, understanding of the universe, but our own cosmology is also linked to socio-cultural and economic norms, which are conveyed to us by elites. Just as “[k]nowledge and skills to discover the natural order, to structure and rate the world by measuring time, space and matter, and to associate with spiritual entities, gave rise to the expert power of the sage, magician,

shaman, medicine man and later to the scientist” (Rappengluck, 2016), the cosmic order of Modernity/Coloniality—a holistic understanding of the relationship between humans, their hierarchies, norms, and the environment—is presided over by a scientific and political cosmic elite (not too dissimilar to the role of scientists and technicians that C. Wright Mills describes in his 1956 *The Power Elite*), and functions as a cohesive and commanding worldview. This highly scientific/objective view of the universe stems from the Enlightenment and its valuation of the scientific method. Yet, the lack of competing cosmic orders is not due to the pure “objectivity” of science. On the contrary, the diminishing number of other cosmic orders is linked to a broader reduction of ways of knowing that followed the historic epistemicides of the colonial project. Admittedly, there have been competing cosmic orders since the rise of technoscience. Indeed, the “Space Race” between the USSR and the United States was a competition to see which cosmic order—Communism or Capital—would rule supreme on Earth and in the heavens. In this way, the control of the cosmos was a continuation of political control through cosmic power. Yet, this conflict was not a matter of ritualistic or observational cosmic power, but, rather, emerged from a contestation over access, which was a new aspect of cosmic orders since the rise of technology under Western Modernity. In this sense, other cosmic orders—or forms of cosmic power—are only possible insofar as they conform to the hegemonic framework of Modernity/Coloniality.

The Colonial Matrix of Power

Coloniality, or the colonial matrix of power, is a framing theory in which changes to systems of authority, knowledge and nature, and violence done by colonialization are understood as a continuing force of social, political, and cultural arrangements, even after the end of formal colonization (Quijano, 2000). Such changes to indigenous societies were intended to enforce Eurocentric political and social structures. These changes—restructuring authority, for example—enabled the subjugation of peoples for the economic benefit of Europe. Such a violent

transformation in relations, fostered on multiple levels or domains, caused Europeanness to become the inspiration (Quijano, 2007). What followed was the transformation of indigenous cultures from, their own ways of being and knowing, to a variety of attempts at “developing” them towards the idea of Europe. Relations with the natural world were changed to match those of Europe. With Europe as the model, and with colonization as the violence enforcing Eurocentric institutions and culture on indigenous peoples, coloniality is the lasting effect on colonized people and their descendants. In the words of Walter Mignolo, coloniality is the theory that elucidates what Modernity keeps invisible: the darker side of western Modernity—those necessary horrors constituent of “progress”(1995). The history and experiences of the colonized peoples and their descendants is not considered essential to the development of the West. Yet, Europe’s growth in political and social power was a consequence of siphoning off wealth from the indigenous population of the Americas and of enslaved peoples. As the rich materials of colonial nations were exported from the “new world” to the European continent, vast wealth was accumulated from this exploitation of lands and peoples in the ‘new world’ that allowed for the modernization of Europe and later the United States. As I will be explained in a later section, the socio-historical transformation and the conquest of the Americas transformed all aspects of the world, including conceptions of the human and the subhuman and conceptions of nature, from a variety of indigenous natural relations to a single extractivist relation of capitalism. Quijano explains this best by stating:

Modernity/Coloniality constructs “the relations between European culture and the other cultures [that were] established and maintained, as a relation between ‘subject’ and ‘object.’ It blocked, therefore, every other possible relation of communication, of interchange knowledge, and modes of producing knowledge between cultures, since the paradigm implies that between ‘subject’ and ‘object’ there can be but a relation of externality.” (Quijano, 2007, p. 168)

This relationship of subject and object extended beyond the relations between cultures as everything in the world became totalized under the new world order. The conquest of the Americas by European powers rendered all ways of being, forms of knowledge and people as the external Other. In the case of peoples, the other was deemed subhuman. In forms of knowledge, the Othered was deemed irrational and inferior. Yet, there is an inherent paradox of this “subject” and “object” relationship: only the Eurocentric perspective can possess a subjectivity, yet it also functions as the only acceptable and possible arbiter of objectivity. In this sense, the subjective lens of the Eurocentric “I think” is portrayed as neutral and objective.

There is another fundamental contradiction that arises from the tension between the reality of coloniality and the appearance of Modernity. As Mignolo and Tlostanova report:

Firstly, at an economic level and for the first time in the history of mankind massive appropriation of land and massive exploitation of Labour (e.g. African slaves) were oriented to the production of commodities for a global market as Annabelle Gennaro and Immanuel Wallerstein have suggested, the Americas were not incorporated into an already existing capitalist economy, but on the contrary, a capitalist economy as we know it today could not have existed without the discovery of America (Mignolo & Tlostanova, 2008).

In other words, the system was made possible only through the massive exploitation of land and labour. Despite this massive colonial exploitation of land and labour, Modernity conceived of the “universal” notions of nature and humanity. Yet, these “universal” notions of Modernity could not be produced without the specific historical exploitations of Modernity/Coloniality. I focus on the assumptions about the epistemology and ontological natures of nature and humanity under Modernity because these constructions are both perceived as ‘givens.’ Consequently, the economy is one of the domains of the colonial matrix of power that intersects with both the conditions of “being” and of nature. In this way, “the complementary movement of land appropriation and labour exploitation meant simultaneously the dismantling and over-ruling of other existing relations

between human beings, society, land, and labour” (Mignolo & Tlostanova, 2008). This over-ruling led to the supremacy of Eurocentric conceptions of these relations and reduces the ways in which peoples might relate to land and labour to that of capital—enslaved or coerced. As Marcina Gomez-Barris describes it, “before the colonial project could prosper, it had to render territories and people extractable” (Gomez-Barris, 2017, p. 5). This ‘extractability’ occurred through the “catastrophic transformation of whatever we can consider as human space, time, structure, culture, subjectivity, objectivity, and methodology, into dehumanizing coordinates or foundations that serve to perpetuate the inferiority of some and the superiority of others” (Maldonado-Torres, 2016). Beginning with colonization and the co-development of capitalism as the world economic system, this transformation reduced or eradicated all other ways of being/seeing/doing. “Human and nonhuman multiplicity” was rendered mute (Gomez-Barris, 2017). In short, it was more than just the colonization of land; it was the “colonization of the imagination.” (Quijano, 2007) . Not only does the colonialization of the imagination subdue beings in their own times and spaces, but it also eliminates the possibility of futurity (i.e., the future as *other* than the past or present).

If the colonial matrix of power is the illumination of the continued impact of colonialization on peoples across the world (stemming from forced changes to their ways of life, knowing and nature), then attempts at addressing or claiming “universality” must be interrogated. If European colonial power violently suppressed other ways of knowing and being, and replaced them with Eurocentric models, then claims of universality are founded upon genocide and what de Sousa Santos calls *epistemicide*: “the systematic eradication of other ways of knowing, or the “murder of knowledge” (de Sousa Santos, 2014). More than just problematizing the European conception of universality, it problematizes European epistemologies by revealing the inherent colonial violence within. These two aspects of the Eurocentric world view are *Las Rajaduras*, or cracks, in the ‘European as universal’ frame. The murder of knowledge and the violent roots of Cartesian

philosophy reveal how much Eurocentric Enlightenment values and “truths” do not expand ways of knowing and being, but rather limit them. Such limitations produce exploitative narratives that further violence and do not permit a view of the future that is not merely a reproduction of a limited cosmology based on normalized violence. Yet, it is necessary to provide a concise history of epistemicide to clarify the violence and limits of Eurocentric epistemologies. The history of colonial epistemicide reveals that the forms of conquest and structuring of categories of people did not begin solely in the so-called new world, that the model of genocide with epistemicide began on the European continent with the removal and cultural domination of the Moors and Jews from the Iberian Peninsula. which involved the destruction of spiritual and cultural elections for both group (Grosfoguel, 2013). This was the goal of the Castilian Christian monarchy as they tried to unify the peninsula (Grosfoguel, 2013). According to Garrido Aranda as cited by Grosfoguel (2013), this expulsion and domination of the Moors and Jews was the model of colonization exported to the Americas. As Maldonado-Torres observes, when the Spanish colonized the Americas, the religious notion of *idolator* was applied to the indigenous populations which Othered them and took on a more secular and racialized meaning (Maldonado Torres, 2014). What was discourse regarding conversion to Christianity through the rise of secular philosophy became “primitives to be civilized”¹ (Grosfoguel, 2013). With the already existing form of cultural domination, the secularization of Othering, and conditions ripe for capitalist accumulation, the conquest of the Americas formed the basis of a new emerging world order.

This is not the hegemonic historical account of Europe. Usually, the navel-gazing and flattering histories of the West start with the Golden Age of Athenian democracy and Socratic philosophy, which led to the Imperial triumphs of Roman world, which, in turn, was followed by the

¹ This would evolve more into the conception of Development.

spread of Christendom in the medieval period and culminates in the glorious humanistic Renaissance that gave birth to modern Western Civilization (Dussel, Krauel, & Tuma, 2000; Grierson, 1975). As Karl Popper puts it in the first volume of *The Open Society and its Enemies*, “Our Western Civilization originated with the Greeks” and—due to its inherent rationalism—culminates in the formally democratic societies of Anglo-American capitalism (Popper, 1966). All history that is tribal or primitive prehistory has no effect on the linear narrative of “progress.” Some points of this history obviously engage with an exterior, after all, what is an empire if there is nothing outside of it to conquer? Yet, these historical moments are treated as development. Modernity—with its technoscience, democracy, and wealth—is the maturation of this path. Modernity is the assumed goal. Yet, when coloniality is revealed to be the real source of this wealth, land and progress, this myth of Europe falls short. The solely intra-European account of historical development functions as a celebratory account of the modern world order that reinforces the Human/Man.

Colonization was the structural conquest of lands by certain European nations starting in the sixteenth century, in which societies and cultures around the world were violently dominated. The European powers colonized parts of Africa, Asia, and the Americas. According to Quijano, colonization constituted a “new world order, culminating, five-hundred years later, in a global power covering the planet. This process implied a violent concentration of the world’s resources under the control of and for the benefit of a small European minority—and above all, of its ruling class” (Quijano, 2007). As such, Quijano sets the foundation for an examination of the colonial traces. None of these traces, according to Quijano and later, sociologist Ramón Grosfoguel differentiated colonialism from coloniality. “Coloniality,” he writes, “refers to the continuity of colonial forms of domination after the end of colonial administrations produced by colonial cultures and structures in the modern/colonial world-system” (2013).

These theories about the coloniality of power illuminates the interconnected structures of domination, including the cultural, social, economic, and political forms of power and ways of knowing and subjectivity (epistemology) (Mignolo, 1995, 2011; Mignolo & Walsh, 2018). Colonialism caused the subjugation of peoples across the world in forms that restructured gender, race, conceptions of nature and distribution as well as epistemology. In the form of Modernity/Coloniality, these reformations forced upon groups by colonial administrations and their apparatuses had a lasting effect. The subjugation or outright loss of cultural and social forms limited the possibility of any stable alternative cultural form. In fact, the European cultural and social form became the default and reinforced way of being (Mignolo & Tlostanova, 2008).

Western Christian philosophers of the European Middle Ages formulated their own local totality, i.e., particularities, into universals. Such Christian and European cosmologies excluded the possibility of other cosmologies, whereas other cosmologies could accommodate alternative views of the universe. In this sense, Christian cosmologies and European universals formed a totality that could become totalitarianism as it did not permit the existence of other understandings of the universe” (Mignolo & Walsh, 2018).

According to Dussel, the common and dominant narrative of Modernity is an internal sequence of events and ideas (Dussel et al., 2000). Dussel’s Europe depicts the modern European world as an ideological descendent of the Greek world, followed by the Pagan and Christian worlds of Rome, which, in turn, is followed by the Medieval Christian world (Dussel et al., 2000). For Dussel et al, this is an (obviously) euro-centric concept (369), but it is hegemonic: “it indicates intra-European phenomena as the starting point of Modernity and explains its later development without making recourse to anything outside of Europe (460-70).” Dussel continues, “for many, Galileo (condemned in 1616), Francis Bacon (*Novum Organum*, 1620); or Descartes (*Discourse on Method*,

1636); could be considered the forebearers of the process of Modernity in the seventeenth century (470).” This is a crucial point as it reveals the apparent philosophic foundations of western Modernity; Galileo was the forerunner to the scientific and technological currents of Modernity, Bacon cements the modern understanding of nature, and Descartes’ philosophy of subjectivity laid the groundwork for modern philosophy and the conquest of the Americas (Dussel et al., 2000; Grosfoguel, 2018). For Dussel, this intra-European analysis of the development of Modernity falls flat, because it does not account for global relations. By ignoring or destroying the rest of the world, Europe’s power and greatness is made innate.

Several ideas come together here: European subjectivity is the basis for “humanity” as well as the objective lens, becoming the point zero—masking the subjectivity of the observer, if and only if they are western²—only by using western conceptions and constructions. The othering and commodifying of all things, lands, peoples, and cultures by way of the Atlantic circuit, and coloniality produces an orientation by which the “human/man” can only relate to all other living and non-living things through the mode of exploitation, even when that orientation is masked by knowledge-production. As I demonstrate in Chapter Four, the Killian formula articulates these exploitative aspects of Eurocentric epistemology and shows that American space policy is shaped by the logic of Modernity/Coloniality.

Evidently, the foundations of the scientific and western methods are saturated with the legacy of colonialism and the acts of conquering, which Castro-Gomez describes as “the hubris of zero degrees” (Castro-Gomez, 2008) The Modernity/Coloniality structure contains humans who are ranked as not-human, transforms nature into a stock of “natural resources,” and regards Western subjectivity as if it were universal objectivity. As Maldonado-Torres puts it, this “metaphysical

² Or accepted as Western through tokenization.

catastrophe turns a potential world of human relations into one of permanent forms of conquest, colonialism, and war” (2016). The normalization of these forms through Western hegemony for five hundred years means that this violence has become acceptable, and, in many cases, victims are considered at fault for their lack of “development” or any number of racial, ethnic, or religious associations. Due to this process, Europe created the myth of itself by way of the conditions of colonialism and modernity.

Not only did the myth of Europe produce these normalized socio-cultural structures, but it also created notions of what it was to be a “good human” within this framing. Such a construction of Europe is a cosmic order, and all cosmic orders conceptualize what it is to be human. Although this Eurocentric conception of humanness is considered to be a scientific definition, some expressions of humanness are not accepted.

The modern/colonial being is a product of Cartesian “I think,” which Dussel describes as a product of the previous one-hundred and fifty years of “I conquer, therefore, I am” (E. Dussel, 2016; Grosfoguel, 2013) Both Grosfoguel and Dussel argue that “the modern *ego cogito* was anticipated by more than a century by the practical Spanish-Portuguese *ego conquero* (I conquer) that imposed its will (the first modern ‘will-to-power’) on the indigenous populations of the Americas” (Dussel, 471). To be a good human, then, was to be the “I think/I conquer.” However, not all humans were able to claim this identity, as the violence of colonialism normalized systems of violence and stigmatization onto conquered people. As previously mentioned, the Modernity/Coloniality structure was enforced and reinforced through the four genocide/epistemicides that produced a cosmology of normalized violence against peoples who are closer to ‘nature’ than to the Imperial being, the Human/Man.

In addition to the overdeterminations of Human/Man as “I think/I conquer,” the Cartesian “I think” replaces and secularizes the Christian God’s omnipotent position. As Grosfoguel explains, “[a]lthough Descartes never defines who this “I” is, it is clear that in his philosophy this “I” replaces God as the new foundation of knowledge and its attributes constitute a secularization of the attributes of the Christian God. For Descartes, the “I” can produce a knowledge that is truth beyond time and space, universal in the sense that it is unconditioned by any particularity—“objective” being understood as equal to “neutrality” and equivalent to a God-Eye view.” (Grosfoguel, 2013) . This is how the European Human/Man can possess the only acceptable subject position and transform it into the only acceptable position of objectivity: Such a god-like worldview seizes and produces the “right” to determine the inferiority or superiority of knowledges, ways of being and seeing, and produces a cosmology that is determined to be Truth. The Western acceptance of, and reliance on, dualism reinforces this as does the accepted hierarchy of the cosmic order. If this is the construction of the Human/Man, then as Sylvia Wynter says, “it is the people of the militarily expropriated New World territories, as well as the enslaved peoples of Black Africa, that were made to reoccupy the matrix slot of Otherness” (Wynter, 2003, p. 266)

To be a “human,” by Eurocentric standards, was impossible for the colonized, because they were neither “the rational” (in terms of “I think”) nor Christian (later secularized and racialized). This exclusionary idea of Human/Man was transformed into the abstract “Man2,” which rendered most of the world’s population “exclusionable,” extractable and exploitable (Wynter, 2003). This is the theoretical framework of the colonial matrix of power: the conquest of the Americas, Africa, and Asia by the European colonial powers transformed the world into a system of colonizer and colonized, reshaping the indigenous relations of authority, gender/race/sex, the economies (nature), and knowledge/subjectivity. While the indigenous practices were violently suppressed and peoples were murdered or enslaved en masse, Europe too was transformed. The secularization of

governance and the common will of the people (white men) became possible through the exploitation of land and peoples on the other side of the world.

European and (later) American hegemony produced the structural influence necessary to normalize these hierarchies, through the world system of the nation-state as the sole political formation, and through the economy, which can only be based on capitalism or “war.” This is still apparent today in contemporary forms of racism, sexism, transphobia, class oppression, and conceptions of disability and ability, as well as ethnic, and religious identities. These forms of exclusion leave only the Human/Man as a direct descendent of the Cartesian “I think,” and thus make the “conqueror” the only accepted “human” form under Modernity/Coloniality. This is the condition of ‘war’ that Maldonado-Torres describes as becoming normalized under the conditions of Modernity/Coloniality, wherein the mass genocide of living creatures and the disregard for life are acceptable (Maldonado-Torres, 2016). To be “Human/Man” is to be a death-oriented conqueror. As Catherine Walsh states:

(this) Man/Human who created and managed the Colonial Matrix of Power, positioned himself as the master of the universe and succeeded in setting himself apart from other men/humans (racism), women/humans (sexism), from nature (humanism), from non-Europe (Eurocentrism) and from the ‘past’ and ‘traditional’ civilizations (Modernity). Nature, the domains of the colonial matrix of power, lies between the domains of economics and politics; it was invented by Man/Human in the process of him setting himself up in the locus of the enunciations (institutions, actors, and languages) that created, transformed, and managed the rhetoric (Narratives) of Modernity, and the necessary and concomitant logic of coloniality (2018, p. 163).

In this quote, Walsh demonstrates how one class of people creates a cosmology to discredit all others. This is the cosmology by which Human/Man thrives, while all Others are subjected to the conditions of coloniality that regulate their lives: the normalized violence of the economy, the internal violence of the Nation-State, and the acceptance of military violence on the part of the state. The structurally dualistic orientation of Eurocentrism means that all that is Othered by the

Human/Man becomes its opposite. Consequently, the Human/Man—the abstract universal human—is an Imperial being, whose practices lead to the death of all others that can be exploited.

The logic of coloniality renders the natural world exploitable (Alimonda, 2020; Dussel et al., 2000; E. D. Dussel, 1995; Gomez-Barris, 2017; Grosfoguel, 2013). The environment is the opposite of culture, which establishes Human/Man as superior to others. Through the access to materially rich lands, the mass enslavement of Africans by the Europeans, and the repressions of other epistemologies, the colonial matrix of power was constructed to benefit Europe through raw materials, epistemological dominance and the normalization of the conditions of war (Maldonado-Torres, 2008). Subsequently, wealth, power and access has become concentrated and centralized within the West. These are still the conditions as Modernity is built on the backs of those Others. According to these conditions, the nation-state is the only legitimate political structure, and capitalism is the only legitimate economy for the West (Mignolo, 2011; Mignolo & Walsh, 2018). What was once colonialization of lands through military force is now development, regulated by the market. The destruction of nature, including, but not limited to, the changes happening to the climate, threatens all living beings on Earth, yet this is not considered nearly as important by economic policies and systems, because most of those harmed by these systems are either not-human or not-human-enough (Gomez-Barris, 2017; Grosfoguel, 2013; Howell, 2000). In this sense, I consider the Human/Man to be death-orientated as he appropriates all things to an eventual point of destruction, even of the self. Here, I quote Mignolo and Walsh at length:

Extractivism, possession, and dispossession have a long history in the formation and transformation of the CMP. From the sixteenth century through the nineteenth, extractivism targeted New World gold, exploiting and enslaving Indigenous and African peoples. After the Industrial Revolution, extractivism concentrated on those natural resources needed to feed the machines. And the from the second half of the twentieth century to the present, extractivism has fueled the so called Fourth Industrial (Technological) Revolution (Mignolo & Walsh, 2018).

This process of extractivism has always fueled the oppression of Indigenous and African peoples, even after the so-called era of decolonization after World War II. The reduction of nature to a source of Human/Man's riches produces a conception of nature that only exists for the use and enslavement by Human/Man. Consequently, any other relationship between Human/Man and Nature is suspect and holds no power, because the only legitimate relation is conqueror-to-conquered. While many other cultures have or have had intimate, dialectic and integrative connections to nature, the West places culture outside of, and above, nature (Escobar, 2008). These are the relations to nature that were exterminated or repressed through colonization and after (E. D. Dussel, 1995; Grosfoguel, 2013; Howell, 2000; Kheel, 2008). It is through the colonality of nature that Human/Man has cultivated his relationship with any form of space. This is a relationship and definition that limits the possibilities of humanity and how it encounters outer space. The Western conception of nature was outlined and influenced by Francis Bacon in his work *Novum Organum*. The eco-feminist Carolyn Merchant has summarized Bacon's impact on the metaphors associated with Man and Nature: "Nature must be 'bound into service' and made a 'slave,' put 'in constraint' and 'molded' by the mechanical arts" (1996). These exploitative metaphors express the Human/Man's relation not only to the Earth, but also to racialized and gendered subjects—both colonized and white women—and knowledge. As such, the condition of Human/ Man as exploiter forces all things—living or dead—into the position of the exploited or exploitable. The idea that man and nature are opposed to each other, and that God placed man as the ruler of the natural world for his own needs is a myth that cannot continue to be the foundation of the world.

Yet, capitalist production requires an ever-expanding dominion over the Earth. As Rosa Luxemburg explains:

Capitalist production can develop fully only with complete access to all territories and climes, it can not confine itself to the natural resources and

productive forces of the temperate zone than it can manage with white labour alone. Capital needs other races to exploit territories where the white man cannot work. It must be able to mobilise world labour power without restriction in order to utilise all productive forces of the globe (Luxemburg, 2003).

In this quote, Luxemburg details the connection between the development of capitalism and the necessity of colonialism. Colonial administrations must destroy indigenous cultures and ways of knowing and implement forced labour to render colonized peoples “useful” to capitalism. This is how colonialism and capitalism produced Modernity/Coloniality. The celebratory aspects of Western Modernity—the Enlightenment, the Nation-state, technoscience and the secularization of the world system—are the consequences of colonialism and capitalism. Although colonial administrations have ended, their impact on the socio-cultural, political, and economic dynamics of formerly colonized countries remain. Capitalism and coloniality are still the major components of the world system.

The most influential global system is the neoliberalization of all non-economic aspects of the world. Neoliberalism is a trend within policy and larger political and social forms that seeks to orient all aspects of life to the needs and imperatives of the (capitalist) market. What was once a right or social relation has become—through privatization and austerity measures—a tool or source of revenue for the free market. Neoliberalism in the United States has seriously affected the spheres of healthcare, education, and agriculture, among other things. In the American context, the path towards neoliberalism is paved in political policy and rhetoric that values the “freedom” of the market over the government. According to Brigitte Young:

At the most fundamental level, neoliberalism builds on the classical liberal notion implying the triumph of market forces and individual autonomy over state power. But there is a considerable normative divergence between advocates of neoliberal ideas, who celebrate the ascendancy of the market, and those who suggest that the policies of neoliberalism are associated with global inequality, economic disparity, growth of unemployment, social exclusion, environmental destruction, and cultural homogeneity (2011).

From a decolonial perspective, this definition of neoliberalism produces a picture of the world, where, as de Sousa Santos states, the new social contract is:

structural unemployment, precarious work, work without rights, and slave-like labour, alongside scandalous salaries in the financial sector; bailouts granted to banks, yet denied to people unable to pay their mortgages or debts incurred in obtaining and education; the return of reactionary ideologies that substitute the principle of individual culpability for the principle of social responsibility and the fill the political agenda with calls for the sick, poor, or elderly to die fast in order to lower public spending on health; and the abysmal increase in social and economic inequalities within and among the countries of the world-system.³ (83).

If this is the world of the “global north,” then the global south is excluded from social contract altogether. Consequently, the population of the global south is left out of the Western concept of the social. These structures benefit very few, even though these structures and produce the policies and agendas for the exploration (and, in turn, the exploitation) of outer space, which, according to almost all space advocates, yields benefits “for all mankind.” Perhaps, then, “mankind” does not include most of humanity. For the purposes of this work, I work with the idea of neoliberalism as it developed in the 1970s. Brigitte Young again:

Today the term *neoliberalism* is used to describe global economic processes of governance systems that fundamentally reconfigure contemporary economic and social systems around the globe. Neoliberal economic ideas emerged as a result of the economic stagflation of the 1970s. This in turn led to a rejection of the postwar consensus of Keynesian demand management. Most prominently, Margaret Thatcher and subsequently Ronald Reagan popularized a radical market-oriented system based on supply side economics and rejecting state intervention in the economy. The closest approximation today of a neoliberal socioeconomic model in the real world is the United States (2011)

The neoliberal expansion was not limited to Earth-bound political or social forms. For instance, the Nixon doctrine (which will be taken up more in chapter 4) attempts to remove governmental leadership of space exploration space and entrust it to private industry, a move that would be carried

³ The rather harsh reality of writing this section as the global COVID-19 pandemic crosses the 1 million cases milestone while the sitting president of the United States aims for 250,000 deaths in the States and politicians are willing to publicly say that those deaths are acceptable for the future economy.

out more successfully by President Ronald Reagan in the 1980s. Returning to Karl Marx's ageless point, "the processes of production have mastery over man instead of the opposite" (Marx, 2013, p. 175). If, as the materialist conception of history shows, the world impacts the concepts, ideas, and consciousness of humanity, then these neoliberal practices and their associated will shapes the visions of the future in space. I will expand on this idea in the next two chapters. Indeed, the very core of my argument is that the material conditions of the world influence and shape our conceptions of the universe. And so, the colonial practices and structures of the American cosmic order threatens to launch a continuous capitalist and colonial expansion into space, which does not merely impact how and why we perceive space, but, also, constrains our own internal relations to each other and our worlds.

Cosmic Orders

Modernity/Coloniality are not the only structures that impact epistemological and ontological forms as discussed in the introduction, cosmic orders define how a culture or civilization understands itself in relation to the cosmos. In the American context, the conditions of Modernity/Coloniality produce a cosmic order that reinforces and reflects itself in a relationship to the cosmos reduced to a relation of exploitation. Unlike ancient and pre-modern medieval cosmic orders, the current hegemonic American cosmic order is not founded upon a cultural understanding of how the culture itself fits within the cosmic order as a natural component, but, rather, conceives of itself—America—outside of it with the might and right to exploit nature. Before I explain how this occurred, it is important to detail cosmic orders and their forms. Cosmic orders do not only form the self-understanding of a society and the cosmos, but also regulates other relations as well: what it means to be human, what sorts of authority are legitimate, ways of maintaining power and religious significance. Unlike cosmology, the branch of astronomy that studies the origins and the

evolution of the cosmos, cosmic orders or cosmologies “denotes the knowledge of a given society about the composition of the universe and the place of humankind within it” (Ossio, 1997). As such, a cosmic order is not simply the composition of the physical world, but of the political, cultural, and social worlds as well.

As Krupp writes, “People in organized societies trace the lineage of their institutions to sources with enough power to justify the way things are. We find it important to demonstrate that our ways of governing ourselves, of organizing ourselves, are part of the natural order” (Krupp, 1983). This natural order is found in the heavens, in both astronomical phenomena and celestial signs regarding changes in season associated with agriculture. Living in accordance with the natural order is both practical and sacred: the wonder of the heavens, often associated with gods, and its more agriculturally based observations coalesced into successful reassurance—following the astronomical signs, conveyed through the elite, brought bounty, thus reinforcing the need for the elites and sign reading (Krupp, 1983).

According to Krupp, the legitimacy of a cosmic order and the social and/or political order that it reflects was religious in nature (Krupp, 1997). However, although the significant rationale of this ordering was religious, we can still find these structures in secular society. These culturally specific, yet structurally similar, aspects are “The Centre of the World,” “Celestial Empires,” “Mother Earth,” and the most pervasive, “Cosmic Power” (Krupp, 1997, 2015). They continue to function as the links between “the architecture of the universe, the patterns of nature, the fabric of society, and the personal environment” (Krupp, 1997), even though the contemporary West is adamant that the knowledge of outer space is based solely on scientific and measurable observations (Beery, 2016). Thus, our understanding of the universe orders and reorders the structure of our world. We understand our relation to the world around us by common consent regarding legitimate power. Although these hierarchies may seem disconnected from the cosmos, the cosmos continues

to be a major source of legitimacy and power even today. To illuminate this point, Beery summarizes the nature of cosmic orders in this way:

Regardless of the socio-natural practices of different communities, many societies affiliated cosmic (i.e., universal, natural) power with the celestial realm. The celestial realm, as the site of power, informed and substantiated terrestrial power, but how the cosmos and the celestial realm were structured, as fixed, universal, and all-powerful as they were portrayed to be, were inescapably social constructions, productions of social organization, and corresponding institutions of power (Beery, 2016).

Krupp's anthropological work indicates that cosmic knowledge often legitimates state power. In ancient China, for example, the dynastic control of the calendar not only organized bureaucratic process, but also justified the power of the Emperor (Krupp, 1997). Power, empire, and sacred relationships with the gods derived from any given cosmic order. The legitimation of institutions, roles, norms, and relations through cosmic association exists across the globe in culturally specific forms with sun, Moon, or constellations as the source.

The "Center of the World" is an aspect of cosmic orders that demonstrates or exerts power as cultures claim ownership or occupation of a specific and significant spot, and recreate the order of the universe physically, as the Inca did with their capital, Cuzco, or political (Imperial) organization reflecting the structure of the cosmos like that of Kublai Khan (Krupp, 1997). Successful and prosperous cultures attribute their accomplishments and affluences to a deity's approval of their ways, which leads to a perceived concentration of cosmic power at their Center of the World. The Center of the World holds power because the success of the culture reaffirms their connection to the cosmos. Of course, this does not mean that it is the literal centre of the world. It serves only as the symbolic center for that culture (Krupp, 1997). As Krupp writes, power is transferred between sky and Earth in a ceremonial space that incorporates astronomical phenomena, mimics principles of cosmic order, and hosts rituals in which the power of celestial forces is solicited" (Krupp, 1997). The hosting of these ceremonial space and rituals often corresponds to the

centre of the world of that culture. The reproduction of the celestial forms within society is continually validated, and, in turn, the cosmovision is sustained.

Celestial empires operate similarly and mimic the cosmic myth to establish and hold political power. There is also often a claim to sky divinity, as was seen in Imperial Japan's relation to the Sun, and with the Mongols with Eternal Blue Heaven and the expression of power through territorial expansion (Krupp, 1997). There were divine links between god(s) and the expansion of empire, not unlike the Catholic church's missionary work. In the case of the Mongols, astronomy and celestial blood were the tools by which the divine communicated to the state (Krupp, 1997). Historical and cultural references to a celestial source of power that justifies the actions of a nation have been made throughout Asia, the Americas, the Pacific cultures, Africa and Europe (Krupp, 1997). There could be a cosmic divine relation, or an observational one or both. The power of prediction can become a great advantage for a state, such as Imperial China (Sun, 2015). In this context, celestial power derives from predictive knowledge, the establishment of timekeeping or the abilities to read cosmic omens (Krupp, 1983, 1997, 2015). During the Space Age, power was still defined in relation to the cosmos as cosmic power became the ability to explore and exploit outer space (as the engineering prowess for sending rockets into space).

Mother Earth, conceptually relevant while also entirely cliché, is one of the more complex aspects of the cosmic order. After all, what is cosmic about Earth? Unlike the known cosmological "bodies," Earth is life-giving. Many ancient cultures believed that harmonious relations between the peoples, the Earth and the cosmos produced fertility. Of course, this fertility was agricultural and thus subject to the seasons, which were understood through astronomical practices (Krupp, 1983, 1997). After all, Earth is intimately connected to the sky. As Krupp explains, "[t]here was power in the sky. The tides resonated with the phases of the Moon; the seasons fell into place in concert with the sun and the stars; the world and its inhabitants followed the seasons (Krupp, 1983).

In her excellent piece “Unsettling the Coloniality of Being/Power/Truth/Freedom: Towards the Human, After Man, Its Overrepresentation—An Argument,” the philosopher Sylvia Wynter draws on Krupp to show how cosmological orders have influenced conceptions of “man and woman” and humanity as a whole (Wynter, 273). According to Wynter:

Archaeo-astronomy has shown that all human orders—from the smallest society of nomadic hunter-gatherers, such as the San people of Kalahari, to the large-scale societies of Egypt, China, the Greeks, and the Romans—have mapped their ‘descriptive statements’ or governing master codes on the heavens, on their stable periodicities and regular recurring movements (Krupp, 1997). Because, in doing so, they had thereby mapped their specific criterion of being human, of what it was ‘to be a good man and woman of one’s kind (Davis, 1992), onto the physical cosmos, thereby absolutizing each such criterion; and with this enabling them to be experienced by each other’s subjects as if they had been supernaturally (and, as such, extrahumanly) determined criteria, their respective truths had necessarily come to function as an ‘objective set of facts’ for the people of that society—seeing that such truths were now the indispensable condition of their existence as such a society, as such a people, as such a mode of being human (270).

In this rigorous interpretation of Krupp’s cosmic order, Wynter picks apart the implications of the cosmic order. For Wynter, this relationship, one of society and physical cosmos, determines what it is to be human. In this way, the idea of the human is made material through the conditions and connections to the cosmos, then is reinforced through normative behaviors. In the case of coloniality, the conception of Human/Man as exploiter is being mapped on to the cosmos in this same way. The cosmic condition is then only understood through the idea of the human that indicates the idea of the heavens. Human beings build their own worlds, then live in them as if they themselves did not construct them (Berger, 1969). This displaces responsibility of oppression or hierarchy onto the cosmos, making it acceptable and mostly unchangeable.

Krupp’s research traces numerous cosmovisions that demonstrate an intimate relationship between culture and the cosmos. Whether its primary purpose was a political or agricultural, there was always a relationship to the sky. These cosmic orders possessed some structural commonalities: the Earth as life-giving, the sky as powerful, the mimicking of celestial patterns to foster success, and

the use of the divinity of the sky for expansion. All these commonalities continue to animate the cosmic conceptions of Modernity. And so, the overarching hegemonic forms of Western Modernity depend on a cosmic order generated by the patterns of colonialist and capitalist systems. These systems are then reflected in the sky. Yet, since the increase in astronomical and aerospace technologies, the relationships between society and sky are no longer simply a reflection of power, but are now also about access, to control, and exploitation. The colonial domination of the cosmos reflects the change toward secular power structures on Earth and reconfigures those of the sky. Whereas celestial power was once reflected in the activities of a culture, the ruling forces on Earth use the structures of cosmic power to justify their domination of sky. As such, colonial power structures have pivoted towards the sky to produce a different relationship. Under Modernity, the dominant relationship between Man² and the cosmos is one of subjugation rather than reverence.

Cosmic orders are “humanity’s imaginative relationship with the universe” (Dickens, 2007). It is necessary to summarize the historical and temporal changes that have occurred with cosmic orders, as the current American cosmic order does not reflect precisely any of characteristics of the ancient cosmic order. The development of the western cosmic order, as Ormrod and Dickens’ trace from ancient Greece to the present day, reveals a few patterns of importance: Hierarchies, secularization, and changes occurring due to the changes in the mode of production (Dickens, 2007). In this dissertation, I am more concerned with hegemonic cosmic relationship than folk ones. This is an important distinction because “cosmic elites” gain power and prestige for their place within the cosmic and social hierarchy while folk relationships to the cosmos are often found in agricultural or Earth based societies for the purposes of survival, which would be categorized as “primitive” (Grosfoguel, 2007).

The American cosmic order is a descendant of the European Christendom and the Great Chain of Being. The Great Chain of Being was the cosmological order of the myth of Europe that

ranks all material beings—living and lifeless—in a hierarchy from the most important and powerful to the least (Dickens, 2007). This system of ranking included humans and transformed religious associations into racial divisions (Dickens, 2007; E. D. Dussel, 1995; Grosfoguel, 2013; Nee, 2005). This cosmology naturalized power relations, as it was “God-given”. Throughout the conquest of the Americas, Africa, and Asia, and the development of capitalism through colonialism, mass genocide, and epistemicide, the Great Chain of Being was not only legitimized—as non-European people were uncivilized because they did not have faith in the Christian God, participate in Eurocentric forms of knowledge or possess material goods—but also secularized through the Scientific Revolution (Dickens, 2007; Grosfoguel, 2013). As we will see in the next section, the structure of this cosmological hierarchy continued despite massive social, political, and cultural change.

The Early Influences on the American Cosmic Order

As I explained earlier in this chapter, the myth of Europe produces a wholly internal socio-cultural and economic understanding of the development of Europe. Decolonial theorists challenge this by integrating the so-called “margins” or periphery into the history of Modernity, which, in turn, illuminates the constitutive logic of Modernity/Coloniality. The American cosmic order does not share all the qualities of the European cosmic order, because it developed from the myth of Europe to the myth of Manifest Destiny. To understand these differences, we must account for several factors that exist solely in America: American Puritanism; the Frontier; and the tradition of technological utopianism that springs from both the religious and secular aspects of American culture.

In the American national context, the intersection of coloniality and cosmology produces a uniquely racist and capitalist vision of the world that the American cosmic order functions through exploitation as seen in the dehumanization of othered peoples and the reduction of nature to

resource. Yet, the reality of this exploitation at the core of the American cosmic order may appear in cloaked, mediated, and fetishized forms. Although the American cosmic order can be coded as divine, knowledge-based, as part of human nature, or a variety of other conceptions, exploitation remains its vital component. This relation of exploitation functions as the relation to the outside, nonhumans, semi-humans, and the natural world. Yet, the American cosmic order—with its Puritan origins, its capitalist economy, and its intense sense of individualism—has transformed over time from a religious cosmivision to a neoliberal one. Beyond Dussel's "myth of Europe" and the American history of Puritanism, the nation-state building of the U.S. and qualities of 'Frontierism' lay the foundation for American cosmology.

Just as there is a "myth of Europe," there is a "myth of America." Unlike what many contemporary American "patriots" would define as the origins of the United States (1776 and the American Revolution), 1607 and 1620 mark the beginning of the American project (Lehan, 2014). In the early 16th century, two similar religious communities came to the "New World" to escape persecutions in England (Madsen, 1998). The use of the term "New World" is a clue to the worldview of the Puritans. As Robert Bellah writes, "The newness which was so prominent an attribute of what was called the 'new' world was taken not just as newness to its European discoverers and explorers, but as a newness in some pristine and absolute sense: newness from the hands of god (Bellah, 1992)." In this way, the New World is not just new to the Puritans; it is a New World created by God. This notion will later influence the Puritan idea that the Indigenous peoples they encountered were not human, but, rather, an obstacle by which God grants "his chosen people" suffering, as the ancient Israelites suffered in the Wilderness (Bellah, 1992; Madsen, 1998). While the American cosmic order developed in relation to a frontier (an external), that external was always understood in relation to the internal socio-cultural narrative.

The Puritan narrative was saturated with religious and biblical symbolism. The New World was equivalent to the Old Testament “Wilderness.” The Puritans believed that they were new Chosen People who were elected by God to fulfil his divine mission. As the English Puritan lawyer John Winthrop understood it, this mission was to establish “the city on the hill” and create a social unity that aligned the Puritans with the ‘laws of nature’ and the ‘laws of grace’ (Madsen, 1998). The dualism between ‘nature’—the way the physical world challenged and demanded governance of the Puritans—and the ‘grace’ of god—symbols and meanings that provided spiritual depth—formed the basis of the secular and spiritual aspects of New England and, later, American cultural norms (Bellah, 1992). Puritanism—with John Winthrop’s assessment of the New World as the New Israel—defined American exceptionalism as the very core of American identity, with a spiritual and secular mission to bring salvation to the world. This is the foundational myth of America, completely comprised of internally understood and spiritual elements. It represents both a rupture from (the myth of) Europe and a continuation of it. As Stephanson explains, the United States, according to Puritanism, “was a sacred-secular *project*, a mission of world-historical significance in a designated continental setting of no determinate limits” (1996). Such a connection between the secular and the sacred allows the United States to operate within a secular world structure, political, if not cultural, and use technological advancements and scientific discoveries to achieve culturally bound sacred ends. In this case, American’s sacred ends were the salvation of the world and the creation of a new heaven and a new Earth (Bellah, 1992). As Bellah points out, American secular documents, especially the US Constitution and the Civil War amendments, function as moral adjustments to the nation (62). For Bellah, these documents realign the nation’s covenant with God and frame American destiny as the salvation of mankind.

At first glance, such a myth fails to have a cosmological setting. After all, the elements of the myth of the origins of America are those of exceptionalism, relations to nature, and relations to

God. No direct cosmic language or symbolism is present. This is why it is necessary to understand the assumed cosmovision of the Puritans as they combine Old Testament symbols with European conceptions of the natural world during the development of colonization and capitalism.

If the Puritans understood the Indigenous peoples of America as lessons from God and not-humans and understood the natural world of North America as a Wilderness in which the Puritans' destiny would be made rather than a place with its own people and history, *then this is a cosmological understanding*. This is how they understood the world and everything in it. This is the influential myth that cloaks the reality of the events and their meaning. The Puritan's understanding of life in their colony did not, as Michel-Rolph Trouillot puts it, "describe the world; they offer visions of the world" (Trouillot, 2002). They do not show the world they saw, but, rather, *how they saw the world*. This foundational myth is highly influential to the American Cosmic Order as it exists today. The most striking aspect of influence, however, is the idea of a mission that would develop later into "Manifest Destiny," with a reverence for technology and the domination of nature. This limitless mission maps onto the colonization of the continent, which secularized the mission of salvation into the civilizing project of Manifest Destiny as the United States built itself into a full nation-state to compete politically and economically on the world stage.

While the Puritans cultivated their sacred-secular cosmology of the soon to be United States, the continued colonization of this New World brought more Europeans to its shores. While the Colonies began their journey to become a nation-state, the religious ideas about exceptionalism began to secularize, not in a fluid trajectory, but through various influences and convergences of ideas. By 1754, authority in governance was considered by some to be "primarily to God, immediately to the 'common consent'" (Madsen, 1998). This is the link between the sacred and the secular as the authority of the government originates from God but is administered by the American people. By the time of the American revolution, Puritanism in New

England was declining (Stephanson, 1996). After a few spiritual awakenings, it had become obvious that, for the Mission to be fulfilled, repentance was necessary. The tone and temper of American political upheaval—during which the English monarchy was denounced (rightly) as “tyrannical”—was indebted to the religious language of sin and corruption (Stephanson, 1996). Consequently, the American Revolution could be understood through a religious lens, so much so that the Revolution was almost prophetic (Stephanson, 1996).

After the revolution, the newly formed United States had a frontier, which was unknown in Europe. The historian W.P. Webb distinguishes European and American conceptions of the frontier. The European border—a possible frontier that separated nations—were “presumably permanent,” whereas the American frontier was “temporal and impermanent” (Webb, 1952). According to Webb, most of Western civilization understood the frontier as the “edge of sovereignty” or the limits of a nation (Webb, 1952). Yet, the United States did not encounter a recognizable or colonial “nation-state” on other side of the frontier. This is indicative of the racist and colonial assumptions about space and people that produced an understanding of the frontier as expandable and exploitable, which motivated a continuation of the spiritual mission that evolved into a moralistic one (whose Puritan roots were present, but not obvious). Whereas the borders of the European Nation-states had “recognizable” humans on the other side, the American frontier represented as boundary between the colonial conqueror and the “Other” to-be-conquered. While the meaning of the westward expansion was moral and nationalistic, the method was imperialist. As the European powers of the “Age of Discovery” sought to establish themselves as world powers through conquest, America hoped to conquer the Frontier as part of the divinely ordained project of constructing the American nation. Drawing on Turner and expanding on the frontier thesis, Webb notes the benefits of the frontier for the American population, which were national in scale and essential to the fledging American way of life. For Webb, the American frontier was not just a place,

but *a way of existing* in relation to an idea of a temporary space (Webb, 1952). Frontierism then is more than just an encounter with the outside; it is *how to* encounter the outside.

Zubrin adopts this idea from Turner and Webb to argue that, if the frontier is the necessary ingredient for new and “superior” social relations, for more egalitarian political systems and a changing of norms, then Mars could function as the new frontier. For Zubrin, Mars is the ideal setting for a much-needed expansion of Western civilization. In his 1996 book *The Case For Mars*, Zubrin justifies space colonization by portraying the “Frontier” as necessary and beneficial to Europe and the United States (Zubrin; & Wagner, 1996). Admittedly, both Webb’s and Turner’s theories present the history of the American Frontier as solely beneficial. Indeed, Webb gives Indigenous peoples a footnote in his introduction, as though no other population were affected by the European invasion of the two continents.

(Manifest Destiny) was more than an expression: it was a whole *matrix*, a manner of interpreting the time and space of ‘America.’ Seen from that angle, it belonged to the peculiar fusion of providential and republican ideology that took place after the Revolution, a most dynamic combination of sacred and secular concepts. Visions of the United States as a sacred space providentially selected for divine purposes found a counterpart in the secular idea of the new nation of liberty as a privileged ‘stage’ (to use a popular metaphor of the time) for the exhibition of a new world order, a great ‘experiment’ for the benefit of humankind as a whole (Stephanson, 5).

This matrix is made up of the Puritan conception of the Mission, the secularization of Western Modernity, the oppression and violence aspects of coloniality, the drives of capitalism, and the cosmological conception of the Human/Man. All of this comes together at the dawn of technoscience to produce an understanding of the American relations to space that all of those things while being understood at the inherent right of America.

The Puritan strain in American culture may appear to be disconnected from space exploration. After all, advocates and politicians alike wax on about the rational and scientific dimensions of space exploration. Yet, the cultural norms of American exceptionalism created the

“salvation narrative” that animates the myth of the Final Frontier. Originally, American exceptionalism was the idea that the United States of America possessed unique values and characteristics, because it is nation chosen by God to be leaders of the world (Bellah, 1992; Stephanson, 1996).

Ideologically, the Final Frontier rests upon American Exceptionalism. This becomes Manifest Destiny during the 19th century, the movement west across the American continent. This is the place of origin of the Final Frontier metaphor, the reference. “Manifest Destiny, like all ideological power, worked in practical ways and was always institutionally embedded. Historically, it could become a force only in combination with other forces and in changing ways. Not a mere rationalization, it appeared in the guise of common sense” (Stephanson, 1996, p. xiv). All of these forces, systems, norms, and material conditions produces a uniquely American cosmic order. In this, violence is normalized, hierarchy is divine, hegemony is leadership, and the stars belong to us.

Conclusion

Coloniality is the foundation of American (and more broadly, European) political, social, and cultural norms. Forms of oppression and privilege that emerge from colonialism and capital are transformed and perpetuated through coloniality. The domains of the colonial matrix of power, while seemingly separate, interlock to produce a Eurocentric cage in which the world is ensnared. Modernity/Coloniality produces the conception the Human/Man, which is confused with a universal conception of humanity due to Western hegemony (Dussel et al., 2000). Human/Man has the disposition of exploiter, and this is the only accepted relation between Human/Man and Nature. Structurally, coloniality functions to reinforce colonial norms on a global level through the hegemony of the Nation-State, the Western control of knowledge, the economy and norms of gender, race, and sexuality. Due to the history of genocide and epistemicide, the West has a

monopoly on power, wealth, and knowledge, which, in turn, produces cosmology that reproduces colonial norms. The exploitation of formerly colonized countries continues through economic practices that still ensure that vast of wealth is funnelled to colonizing countries.

Historically, cosmic orders have enabled a culture to understand itself in relation to the universe. The various social and political formation of different cultures reveal how they understand the universe. In this sense, cosmic orders justify socio-economic and political structures. Elements of cosmic orders include the conceptions of the Earth as fertile, the power of the sky, the Centre of the World, and empire building through cosmic divinity. The European cosmic order was that of Christendom, which reflected a hierarchy from God to rocks (Dickens, 2007). Although this order was secularized through the emergence of Modernity/Coloniality, some formerly divine structures still exist within European hegemony. Cosmic orders are both epistemological—a way of knowing the world—and ontological—a way of being in the world. Cosmic orders construct what it means to be a “good human” within that order.

The American cosmic order is not a replication of European hegemonic cosmologies, but rather, an evolution of it as part of the project of building the American Nation-State from the Puritans “city on a hill” to Manifest Destiny. Early Puritan conceptions of the New World invoked Biblical language and centered the Puritans of this New World as the Chosen Elect who were carrying out a mission from God. This mission was nothing less than the salvation of humanity. This early self-aggrandizing vision of the American mission was secularized during the events of the American revolution, the constitution of the United States, and westward expansion towards, and engagement with, the Frontier. The Frontier marks a vast political and cultural opportunity to expand geographically as the indigenous peoples and their ways of life are not considered legitimate.

American exceptionalism continues to inspire and shape the belief that America is the leader of the free world.

Coloniality, cosmology, and American exceptionalism merge to produce a uniquely American Cosmic Order, in which coloniality are bound to elements of previous Eurocentric cosmic orders. Extractivism defines the relationship between the American culture and nature and normalizes the exploitation of peoples and the expropriation of land. The increasingly feeble and farcical democratic norms of the United States conceal an imperialist agenda that uses the economic imperatives of neoliberal extractivism to steer global economic policy, as well as space policy. Within this legacy, racialized peoples are not assigned the status of Human/Man, because historically in the United States, they were on the other side of the Human/Man and Nature (for exploitation) relationship. The exclusion of these people from the state has become increasingly normalized, which can be seen through policy brutality, the treatment of refugees and migrant workers, and the violence against women. This is what Maldonado-Torres calls the normalization of the conditions of war (Maldonado-Torres, 2008, 2016, 2020). The American Cosmic Order produces and perpetuates state-sanctioned violence and the violence of capitalism, because it requires an “outside” to exploit and abuse as part of the colonial project of the Frontier.

Hierarchy is the central element of this American Cosmic Order that places Human/Man—the exploiter—at the top and tosses racialized people and the natural world to the bottom. This cosmic orientation of death and exploitation maps onto all political policy. Even the policies that shape and motivate space exploration draw on the deeply colonial imagery and logic of the Frontier. The Frontier functions as the colonial imagery to hide *Las Rajaduras*, those cracks in the colonial construction that reveal *Nepantla*. Which is the condition of uncertainty that allow for revolutionary change to occur. *Nepantla* is Low Earth Orbit. Before I examine this theory, I must examine and illuminate the conditions of coloniality in space exploration. The next chapter is a critical analysis of

the use of the Frontier by space advocates. I hope that a closer examination of this imagery of the Frontier in space advocacy will allow us to glimpse *Las Rajaduras*.

Chapter 3: The Final Frontier

Here, there be dragons.

In fourteen hundred ninety-two

Columbus sailed the ocean blue.

The American frontier is one of the most identifiable tropes of American history and culture. For instances, Westerns are a cultural staple of the United States that have been exported to cinemas worldwide. Many (predominantly white) Americans are culturally comfortable with the imagery of the Western Frontier, because it has been continuously reinforced and celebrated in books, films, political speeches, and other spheres. The Frontier remains one of the most frequently used metaphors for the journey into outer space. The Frontier invokes imagery of vast skies and wild plains. The old Western Frontier represents the grand making of the American nation, where cowboys and ranchers built the towns, mined mountains, and cultivated land to welcome the westward expansion of the American people. This image of the Frontier does not represent the actual history of the US conquest of the continent, but it does accurately convey the *ideology* of the American conquest. Outer space has become the new Frontier, portrayed as the wild and dangerous expanse that courageous men settle as the latest outpost of Western Civilization. The constant reinforcement of colonial ideology in the American cultural imaginary means that the Frontier feels like the most palpable, immediate, and common-sensical historical analogy for America's conquest of space. Frequently, space advocates draw on the imagery of the Frontier to excite the American people about space exploration, especially when these ventures are supported by the US government. Space advocates may employ this captivating and inspiring rhetoric to support their function as an interest group that hopes to influence government policy and resource allocation.

In this chapter, I examine the “Frontier” as a colonial trope. Whether it is used as a historical analogy or an ideological articulation, the image of the Frontier indicates and implicates several domains of coloniality. Although space advocates did not single-handedly produce the Final Frontier as a cosmic order of coloniality (government policy and public perception have a role in that development as well), they favour this metaphor as a tactic to influence policy makers and the public. The specialist groups of space advocates are interested in the exploration of space, yet they must generate support for their initiatives from the political realm and public sphere (policymakers and taxpayers). As hegemonic narratives and influential political positions are the easiest methods and manoeuvres for gaining support, space advocates inevitably promote long- and short-term colonial and capitalist projects, such as the nationalistic propaganda of the Apollo project or the exploitation of resources in outer space.

As soon as the analysis of American space exploration is expanded beyond the “modern nation-state,” the conditions of space exploration reveal a more complex colonial structure. Although the accounts that contextualize the history of space exploration within the boundaries of the nation-state are not wrong, their analysis is simply incomplete. The United States’ project of nation-building in the twentieth century did not develop wholly internally. Following the end of World War Two, the United States developed in competition with the Soviet Union, which was fuelled by an ideological war that lasted for nearly half a century. Yet, the use of the colonial metaphor—the Frontier—did not develop in tandem with the technology required to enter space (as it had a long history starting with John Wilkins, who offered a fictional account of what would happen if Columbus reached the Moon in his 1638 work *The Discovery of the World in the Moone*). Although the Frontier is the exemplary metaphor for the connection between coloniality and space exploration, Human/Man’s orientation towards space has been colonial for over five-hundred years. This colonial orientation towards the cosmos developed alongside the modern world and reveals

two major aspects of coloniality in relation to the cosmos: the nature of Human/Man and the function of Nature.

The Frontier metaphor possesses enormous symbolic power and resonance. This is even why the United States government once commissioned a study on railways in the frontier to determine the benefits of space exploration (Mazlish, 1965, p. 28). The purpose of “the Frontier”—as a constantly-reinforced hegemonic metaphor—has more to do with its cultural significance than its historical accuracy. As the historian Patricia Limerick writes, “[t]he metaphors and comparisons and analogies that a group choose do in fact carry a lot of meaning and can indeed control actual behavior. The metaphor you choose guides your decisions—it makes some alternatives seem logical and necessary, while it makes other alternatives nearly invisible” (1992, p. 148). Limerick suggests that the Frontier metaphor is often used to determine whether certain possibilities—positive and negative—are either viable or unrealistic. Gloria Anzaldúa makes a similar point about metaphor: “metaphor and symbol concretize the spirit” (Anzaldúa, 1986, p. 123). In the case of the Frontier, these concretized possibilities are determined by the spirit—and logic—of coloniality. Limerick continues:

The pattern of comparing space to the frontier is not a light or trivial matter – that, in other words, thought, behavior, and especially appraisal of what options are available, are all limited by a misused metaphor. And on the other side, the space community’s thinking, and sense of options and alternatives, could gain new force and new range, with a properly used metaphor. (1992, p. 250)

I do not know about Limerick’s suggestions for a “properly used metaphor,” yet it is undoubtedly the cause that the Frontier metaphor does not celebrate the possibilities of human life in space. On the contrary, it relies on the What Has Been to produce the Not Yet.

Yet, the impact of coloniality on space advocacy and exploration cannot be reduced solely to the Frontier metaphor. This is simply a framing that advocates use to justify space exploration that

caters to anxieties about resource scarcity, overpopulation, the “decline of Western Civilization.” In this sense, life in outer space becomes a promise of our survival. This is where the Puritan American advocates draw on the form of the Puritan salvation narrative—secularized within the capitalist economy in the United States through extractivist and dehumanizing practices—to promise the survival (and salvation) of the whole world through American Exceptionalism. Space exploration is offered as solution to these problems, which have become so naturalized that these advocates do not realize that the problem of resource scarcity is a consequence of capitalism rather than a genuine lack of resources. According to Robert Zubrin, space exploration will lead to a “revitalization” of a Western Civilization that has stagnated since the closing of the western frontier (1996). The more contemporary example of Elon Musk’s plan to “save mankind” posits space colonization as, “back-up plan” that reinforces and perpetuates that an “Outside” will lead to a new prosperous era of capitalism and the salvation of the human species (Bainbridge, 1991a; Musk, 2017; O’Neill, 1977, 1981).

In this chapter, I will take a closer look at the Frontier metaphor in search of *las Rajaduras*—the cracks in the cosmic order of coloniality—that may lead to many other ways of relating to space, other humans, and earthly nature. Only by understanding the real purpose of these ideas and the practices they legitimate—Human/Man, Nature, Peace, and Modernity—can we finally move beyond their limitations and violence. The normalized violence of the Frontier metaphor perpetuated colonial violence, as it valorizes and celebrates the genocide and epistemicide of the Americas by European powers. Just as every cosmic order establishes “humanness,” the Final Frontier establishes Human/Man as the only possible mode of human existence. The Human/Man is the “I conquer” and the “I think” who forces nature to become nothing more than the raw materials for capitalist production. Populations that do not fit the definition of Human/Man are forced into extractivist labor, because, in the cosmic order of coloniality, they are closer to the raw

materials needed for the fires of capital than the Human/Man. The Final Frontier—the Cosmic Order of Coloniality—is the current American cosmic order, which propels the violence of coloniality into the future in space.

The Development of the Final Frontier

If, as Howard McCurdy says, “all great human enterprises are primarily social, and the space program is no exception [but it] could not exist without social support, without the enthusiasm of national leaders and the acceptance of the general public” (1997, p. 31) Then the Frontier metaphor has cultivated an image of space has captivated popular imagination, advocacy and policy for decades (McCurdy & Launius, 2001). Unfortunately, the subject of this grand enterprise of space exploration is the Human/Man. Only those who engage with and support this position of the Human/Man—intentionally or unknowingly—can participate in the expansion of colonial and capitalist systems.

Although the Final Frontier is an imagined condition, and an epistemological approach, imagination can be both intensely personal and inherently socio-political. As McCurdy writes, “imagination matters when societies contemplate new ventures. People have the ability to visualize a solution to the phenomenon with which the society grapples and possess confidence in the attainability of the goal” (McCurdy, 1997, p. 33). This is why Wernher von Braun’s work with Disney, as well as his *Collier’s* articles, were essential to forming the space age, and helped to shape the belief that a future in space was attainable. Although many popularizers of space exploration used neutral language, the frontier imagery was and remains prominent in policy, advocacy, and the popular press. The cover for the March 22, 1952 issue of *Collier’s* proclaims, “Man will Conquer Space Soon.” According to McCurdy, Collier’s sent von Braun on a speaking tour to accompany this issue (40).

What is the historical context of the publication of this issue in March 1952? The Cold War between the United States and the USSR was slowly intensifying as the Korean War pitched the (proxy) forces of capitalism and communism—Good and Evil in the mid-twentieth century American mythos—against one another in open conflict. The use of militaristic language in the *Collier's* cover—“to conquer”—alludes to the political antagonism between these two economic and political factions in the geopolitical arena. At the same time, the language invokes some of the most significant historical events and sources of pride for American culture. Seen through lens of American exceptionalism, the active verb “to conquer” refers to both the Old West and the ideological conflict with Soviet Communism. Space, then, is produced, as Lefebvre noted, through its symbolic and historical conditions (Lefebvre, 1991). The Future Programs Task Group discusses this very production of space in their Summary Report of 1965. Catherine Walsh might argue that von Braun’s production of (outer) space as the Final Frontier (during the Cold War, the American space community believed that this American frontier represents the only future in space for democracy, freedom, and capitalism) is common to colonial framework of the West, in which it is possible for the West “to pretend and act accordingly as if their specific image of the world and their own sense of totality was the same for any- and everybody else on the planet. The strong belief that their knowledge covered the totality of the known brought the need to devalue, diminish, and shut off any other totality that might endanger an epistemic totalitarianism in the making” (Mignolo & Walsh, 2018, p. 195) In short, the Final Frontier is this specific image of the word.

Frederick Jackson Turner was responsible for constructing and canonizing the myth of the Frontier in his 1893 essay “The Significance of the Frontier in American History” and subsequent 1920 book *The Frontier in American History*. Space advocates cite Turner’s “Frontier thesis” as an inspiration and justification for space exploration (; Bainbridge, 2009a, 2009b; Clarke, 1951, 1966, 1973; Cruz, 2018; Elias, 1990; Jenks, 1958; Johnson, 1970; Kauffman, 1994; Kearnes & van Dooren,

2017; Launius, 2000, 2002, 2004; Logsdon, 1995, 2010; O'Neill, 1977, 1981; Sadeh, 2002a; Sage, 2008; Schuster & Peck, 2016; Szocik et al., 2020; Von Braun, 1952, 1991; Ward, 1966; R. Zubrin, 1999; Zubrin; & Wagner, 1996). For Turner, the frontier was not just a part of American history, but, rather, the central motivating component that powered the production of America. The qualities that defined the characteristics of American democracy were forged on the Frontier. According to Turner, the Frontier created the American character, and demonstrated that European culture lacked the necessary elements to survive and conquer it. As Turner puts it:

For a moment, at the frontier, bonds of custom are broken, and unrestraint is triumphant. There is no *tabula rasa*. The stubborn American environment is there with its imperious summons to accept its conditions, the inherited ways of doing things are also there; and yet, in spite of the environment, and in spite of custom, each frontier did indeed furnish a new opportunity; a gate of escape from the bondage of the past; and freshness, and confidence, and scorn of older society, impatience of its restraints and its ideas, and indifference to its lessons, have accompanied the frontier (1960, p. 29).

For Turner, the American Frontier functioned as a set of the material conditions that generated new ways of being and relating both to others and the natural world. The pioneers encountered the environment of the West that was significantly harsher and more inhospitable than the landscapes of European country. According to Turner, it was the meeting-place of “savagery and civilization” (Turner, 1960). It staged the encounter between Human/Man and the wild of nature. According to Turner, the harsh environment of the American West was initially too touch for Human/Man, because European ways of life did not fit these conditions (Turner, 1921). Drawing on Turner’s Frontier Thesis, Webb theorized that the American frontier was so drastically different because, unlike Europe, where borders are semi-permanent, the American frontier was malleable and mutable with no recognizable nation or peoples beyond it (Webb, 1952).

In these accounts, the Frontier motivated and inspired American progress. According to Turner, the Frontier produced most of the defining characteristics of American exceptionalism—the democracy, the individualism, and opportunity—that crafted the very essence of America. He

documents the cases of three classes of people who were attracted to the Frontier: pioneers (who live on the land), immigrants (who develop the land) and capitalists (who purchased the newly cultivated land) All three classes pushed the borders of the nation westward (Turner, 1921). Pioneering, progress, enterprise, freedom, and rugged individualism are the primary characteristics that distinguish the American spirit from the old European ways of life. And so, these dominant values produced the overarching social and political structures of the United States (Turner, 1921).

The Frontier dictates ways of understanding others and oneself. Control, ownership, and power were central to the cultivation of the frontier, as Turner's three classes attest. For the pioneer, the Frontier represents an opportunity to venture into the savage unknown and explore the new wilderness for possibilities of exploitation. In this sense, exploitation was the central characteristic and benefit (for the settlers) of Western expansion. As Turner writes, "the exploitation of the beasts took hunter and trader, the exploitation of the grasses took the rancher west, and the exploitation of the virgin soil in the river valleys and prairies attracted the farmer" (Turner, 1921, p. 16). For Turner, the very core of the Western expansion was the exploitation of "free land." Unlike Europe, where nations and peoples counted as Human/Man, the indigenous peoples and their ways of life were considered legitimate and thus could be subjected to exploitation.

According to Turner, American qualities, such as:

coarseness of strength combined with acuteness and inquisitiveness; that practical, inventive turn of mind, quick to find expedients; that masterful grasp of material things, lacking in the artistic but powerful to effect great ends; that restless, nervous energy; that dominant individualism, working for good and evil, and with all that buoyancy and exuberance that comes from freedom—*these are the traits of the frontier or traits called out elsewhere because of the existence of the frontier* (1960, pp. 28, emphasis mine).

Not only are these characteristics individualistic, they produce, replicate, and represent Western conceptions of humanness, which, in turn, produce the norms and values that dictate how subjects can act towards others and the world. The rugged individualism of the Frontier mentality—that

mastery over material things—reduced all things to a matter of exploitation and control. These characteristics established the “American” way of being in the world and enabled the orientation of exploitation to exist on multiple levels: the social, the political and the economic. All these characteristics—valorized over others at various levels—reduce the potential ways in which one may encounter, experience, or enact humanness or the world.

Contrary to the virginal newness that Turner exalts as the appeal of the Frontier, these qualities and characteristics produce a cosmic order that follows the logic of the colonial matrix of power. After all, the exploration of the so-called “New World” was motivated by exploitation. Even famed astrophysicist Carl Sagan noted that the aim of Columbus’ expeditions was profit (Sagan, 1994). As Krupp writes, part of the cosmic order’s representational power stems from the ability to show how a culture is an established part of nature. (Krupp, 1997). Like the other conquests of the Americas, Turner’s framing of the Frontier as an opportunity for exploitation is an outcome of the colonial logic that shapes and constrains the cosmic order of coloniality. Unlike other cosmic orders, the Western relation to nature is one of exploitation, not of harmony. As such, the culture(s) of the West position themselves outside of nature. Consequently, the cosmic power of the West springs from the control, domination, and consumption of nature.

With the American cosmic order, separation from nature and the conquest of it is the source of meaning and power. Under conditions of coloniality and capitalism, this relation of exploitation defines humanness and nature, and categorizes all other modes of being and knowing as either acceptable or abhorrent. As a result, the frontier is still the dominant image of America and of outer space, because it projects the only acceptable image of the world, namely, that of consumption. As Grosfoguel writes, “we live in a world where the dominant imaginary is still colonial and founded on a very intricate and uneven set of narratives with long histories that are re-enacted in the present

through complex mediations.” Although the imagery of the frontier may appear simple, it conceals a dense and complex set of relations that mediates and replicates American cosmology (Grosfoguel, 2009). The effect of the Frontier imaginary in advocacy and visions of the future of space exploration—a wholly American imaginary with its association with American values—*over-represents and over-determines the limited possibilities of the future*, by restricting the future in space solely to American social, political and cultural forms (all of which express a form of exploitation). When understood in relation to the values of the Puritans’ mission, this transformation from cosmic power in a cosmic order as *power* (derived from understanding and situating oneself within the cosmos) to *Power* as controlling and situating one’s culture outside the cosmos. Such a shift may seem insignificant and irrelevant; yet it impacts how people conceptualize and engage with what they perceive as the role and purpose of the entire universe. Continued use of the colonial imaginary signifies an understanding of the universe (*Power*) as available for exploitation that devalues and misrepresents other forms of relation.

Turner’s notion of the frontier shapes advocates and policymakers’ understanding of space and its uses. The language of the Frontier thesis ties together various threads of religion, progress, individualism, pragmatism, ingenuity, and materiality, and describes a “restless, nervous energy”—an enigmatic and affective turn of phrase that could mean any number of things—and the anxieties of inhabiting a “wild, unknown and dangerous” place. In either case, space advocates pick up on these ideas to produce an understanding of life in space as dangerous (which is correct), that demands an ethos of rugged individualism (cowboys in space), that required gifted intelligence (rocket scientists), and guarantees freedom. In short, these advocates hold the fervent belief that exploring, colonizing, and exploiting outer space is a continuation of American’s duty that draws from its sense of exceptionalism, and responsibility (and an extension of the Frontier).

Consequently, the Final Frontier—as an ultimately retrospective and effete concept—invokes the Western frontier as the framework for producing outer space and anticipating the future. This is a dangerous path to follow once we consider the implications and ramifications of these ideas for space exploration. As Limerick reminds us, “space advocates have built their plans for the future on the foundation of a deeply flawed understanding of the past, [and] the blinders worn to screen the past have proven to be just as effective at distorting the view of the future” (Limerick, 1992, p. 149). In this case, the future in space is portrayed as an American enterprise, except for those who are excluded from the narrative: Native Americans, people of color, and even white women (not because they are not human, but, rather, because they fall outside the definition of Human/Man hegemonic within space discourse). Several space advocates have drawn connections between settling the western frontier and exploring, and constructed histories that feature serious and downright embarrassing distortions of the past. For instance, as Zubrin states, the New World had “no established ruling institutions” (Zubrin; & Wagner, 1996). Although Zubrin’s statements are designed to appear neutral, factual, and objective, they reinforce the profoundly ignorant notion that only European and American institutional structures are legitimate or even extant. (In fact, Zubrin seems to imply that non-European and non-American forms of governance do not even exist).

The Conditions of the Final Frontier

A major element of the Final Frontier’s relation to the western frontier is the denial and justification of the American pioneer’s aggression. Historical work on the western frontier tends to underplay the events of theft and genocide (especially when white historians are narrating the story of America). When certain space advocates retell this narrative, they demonstrate a willingness to convert the actual history of pioneer into a sanitized myth of American heroism (Zubrin; & Wagner,

1996). Frequently, space advocates, and even policy makers, whitewash the history of western expansion. The use of the word “Pioneer” in works of space advocacy appear to match Turner’s use of the word as a description of the initial Human/Man who ventured into the frontier. The “Pioneer” is portrayed as nonviolent, just as Turner portrays his three classes. The title of a 1986 book—an anthology of newspaper articles that concern the subject of space exploration—epitomizes this level of denial: *America in Space: Pioneers or Aggressors*. Such a title immediately separates pioneers from aggressors and normalizes the violence of the American pioneers. Indeed, this separation acknowledges only a certain type of violence. As many of the political cartoons in the book show, this violence is violence that follows the forms, procedures, and laws of military action (Trager, 1986). Interestingly enough, the vast array of military actions that took place in the historical west—the massacres and the forced migrations— never appear on the pages of works of space advocates. On the contrary, we hear of “homesteading in space” (McMahan, 2015) At the same time, the common excuse that “there are no Indians in outer space” is constantly regurgitated to justify the colonial metaphor. As evidence above, I speculate that this has something to do with acceptance of certain forms of violence, especially the forms that are not perpetuated against Human/Man and his political forms, the Nation-State. Unlike military action, homesteading was a form of “war” that became “part of the very order of things” (Maldonado-Torres, 2020).

The Final Frontier metaphor contains several structuring aspects that organize, reference, and reinforce American conceptions of space. The Final Frontier adheres to the cultural Salvation and missionary values that have been part of the American cultural landscape since the Puritans settled on the eastern coast. Furthermore, these values gave rise to notions of Manifest Destiny, the survival of Western Civilization, and American exceptionalism. Those who cast a nostalgic or rose-tinted glance to the American west—or potentially even to Columbus—as a model for what will happen during our future in outer space do two things. First, they project the colonial ideology into

the future in a self-referential and self-aggrandizing sense. Second, they portray space as little more than what the Western Frontier represent to the colonial powers of America: a source of virginal wealth and exploitation. We can discern this nakedly in the goals and objectives of the commercial space companies who are hoping to mine the Moon or asteroids for precious metals and minerals. This is also linked to the salvation narrative, because what was once God's mission has now been secularized, fetishized, and controlled by capitalism. According to Elon Musk, Robert Zubrin and Gerard O'Neill, the salvation of mankind and the world (and the source of fresh resources—an Outside—for a rapacious capitalism) is now in the stars (Davenport, 2018). Such an ideological form of salvation—the survival of “humanity”—appears to function as a kind of righteous or ethical mode of behavior; yet it is only something that serves the perpetuation of the Human/Man as shaped by the market. The free-market constructs and reproduces the Human/Man, and thus only the Human/Man can be saved by the market. Yet, there is another element that the West that space exploration needs to save: The West itself.

The cosmic order of the Final Frontier frames the exploitative aspects of space exploration as morally good and individually beneficial. Capitalism is eternalized and valorized, especially during the Cold War as Western economics and forms of governance are treated by many space advocates as exemplary or representative of a hegemonic common sense. This connection between Human/Man and capitalism is repeated and reinforced in American space policy to demonstrate how space can ensure the survival of mankind through unlimited growth (Brown, 1978). For example, Brown puts forward the case that the economic benefits of space will bring with them “infinite possibilities” for imagining new social and political ways of being. This argument reappears in O'Neill's *High Frontier* with a slight cosmetic change. According to O'Neill, changes to the manufacturing structure will generate more leisure time (O'Neill, 1977). Heppenheimer speculates that zero gravity recreation will be a popular pastime. (After all, how will one spend all that leisure

time in space?). Like O'Neill, Heppenheimer's speculative imagination is hardly tested as he discusses the exportation of already-existing sports and other recreational to the environment of outer space (Heppenheimer, 1977). In their credo, the Space Frontier Foundation state that they are dedicated to a brighter future of a united humanity with free enterprise by "using the unlimited energy and material resources of space" (2019). The abstract notion of humanity that they portray in these works of advocacy fail to examine or explain the working conditions of capitalism, or to understand that this "humanity" is stratified into different classes (which depends on their structural position—and their consciousness of this position—in the totality of capitalist production). On the contrary, they assume that their notion of humanity is characteristic of all peoples; yet truthfully, very few people can access to the gains of capital due to structural mechanisms. Unfortunately, the promise of the "infinite possibilities" of space is reduced to a staid way of life that indulges trivial American middle-class pastimes and ignores the exploitative economic system that makes this kind of social existence possible.

Consequently, the reproduction of socio-economic and cultural norms implies the type of person that matches this future in space. On top of these abstract conceptions of humanity, space advocates fail to fulfil their promise of envisioning a cosmic order of infinite possibilities. While this may be part of advocates' goals of reaching a general audience to gain support for public or private space activities, their failure to imagine a real future is a consequence of their limited conception of humanity as Human/Man, as the "criterion of being human" (Wynter, 2003). Space advocates assume that their norms are either universal or almost universal, that they are the cultural and social norms of "every man." Such assumptions derive from a sense of false objectivity and the history of genocide and epistemicide and build on social and political norms that are encouraged, valorized, and reproduced *en masse*. Those who do not conform to American individualist context have only themselves to blame for not fitting the standards that are repeatedly normalized and remain

exclusionary. Not only are most people systematically excluded from norms and structures, individuals choose not to take part out of discomfort. In either case, the normative, Eurocentric Human/Man becomes coded as an abstract “humanity.” What remains is a homogenous and hegemonic population that reflects American social, cultural, and political norms. Space advocates fail to express or imagine the infinite possibilities of life in outer space, because they feel that they must project and perfect the ways of life of those who conquered the Americas.

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

Yet, the Final Frontier positions the universe for consumption and exploitation. The orientation of the Final Frontier is an orientation of antagonism; it is not about how a culture fits in harmony with the universe, but, rather, how that culture can expropriate and consume that culture. Experience versus use-value is a complicated aspect of the Final Frontier. Individualism values this

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

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

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

The parallels between outer space and the Western frontier are the result of the production of space as a social and political space. These social and political forms are bound to coloniality through systems of oppression, the nation-state, and the economic system of capitalism. As the violence of colonization is rendered historical (and as “there are no Indians . . . in outer space” (Williamson, 1987), colonization is a neutral, even technical, term. Those who use this language of colonization to describe space exploration fall into epistemological blind-spots, because they failure to engage with the history of various power structures and hegemonic discourses. This is one of the ways that Modernity/Coloniality perpetuates “dehumanization coordinates or foundations that serve to perpetuate the inferiority of some that superiority of others” (Maldonado-Torres, 2016). This is why, for example, space advocates can advocate for eugenics without understanding that what they see as the termination of pregnancy that may result in a child with disabilities is tantamount to speculative Martian forced abortion policy (Szocik et al., 2018). Szocik et al stated that “Western

civilization evaluates human life as the most important value and human good,” yet see no paradox in their own devaluation of the lives of peoples with disabilities. Additionally, they fail to advocate or account for the wants and needs of the pregnant person. *Esta rajadura*—this crack—reveals the blatant socio-economic and political construction of this very idea of life. And *esta rajadura*—that crack—demands that a fuller and a more life-affirming future is possible insofar as these problems and constructions are not unknowingly perpetuated.

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

Ironically, the humanism that Zubrin exalts represents the dehumanization of other populations. As such, it is likely that Zubrin's vision of the future—the Final Frontier on Mars—will lead to similar dehumanizing patterns and practices.

Visions of the future

Vision of the future in space are trapped within the colonial assumptions imbedded the frontier metaphor. The two qualities of the “I think, therefore I am” and the “I conquer” are essential to the Human/Men of the cosmology of the Final Frontier, which means that, if this is what it is to be human, then the conquest of Americas is an acceptable blueprint for the venture into space. Instead of confronting the normalized violence of Modernity/Coloniality, these visions of the future reproduce and transport the hegemonic values of western culture into space. Although these visions speculate on potential technologies, the socio-economic principles on which they are based are very much a project and reflection of the author's time (as though these societies only need to develop better technologies, instead of confronting, challenging, and changing these basic values). In this section, I will analyze three visions to elucidate the coloniality at their core: Gerard O'Neill's space colonies, Zubrin's Mars vision, and the vision for a city on Mars as proposed by Elon Musk.

Space colonies are often theorized to be placed at the L5 Lagrange point between Earth and the Moon. A Lagrange point is a point in space that, once an object is placed there, stays in that location due to the equal gravitation pull of large bodies (Cornish, 2018). This location was popularized by the famous space colony advocate, Gerard O'Neill, who speculated about it in numerous articles and in his books, *The High Frontier* and *2081*. O'Neill envisioned a “community large enough to form a powerful industrial base, able to manufacture products of values in quantities great enough to provide important economic benefits to Earth” (O'Neill, 1977, p. 56). For O'Neill, space colonies would operate like islands, with suburban neighborhoods, industrial hubs, agriculture,

and arts and sciences. The depiction of these colonies resembles middle America during the economic boom of the Golden Years (1945-1973): comfortable nuclear families, a bourgeois American value-system, and a capitalist economic framework (Hobsbawm, 1994). O'Neill believed that space colonization needed to expand economically without "fouling the worldwide next in which we live" (O'Neill, 1977). For O'Neill, expansion into space rescues the Earth from resource depletion and exploitation. The benefits for the development of industry in space are the lack of gravity and the variety of resources on the Moon or Asteroid belt (1977).

The High Frontier is mostly a work of speculative engineering as the human and social spheres of space colonies takes up only a few chapters. O'Neill believes that social and cultural life will change very little on these colonies (O'Neill, 1977), as he was more concerned with the economic structures of the colony: trade, income, taxes, growth. (1977, 1981) According to O'Neill, "Poverty is a killer, and the wealth of space should permit most of the total human population to escape from poverty" (O'Neill, 1977). This claim, obviously made from a capitalist perspective, fails to understand that, just because there are more resources, does not mean that those resources will be equally or equitably distributed. Historically, the expansion of capitalism resulted in a vast increase in wealth, and at the same time produced widespread immiseration and impoverishment (Dickens, 2016; Grosfoguel, 2002; Marx, 2013). O'Neill displays an almost blind faith in the capitalist system, which may be a side-effect of the era in which he produced these ideas: the 1960s and 1970s, which featured some of the hottest events of the Cold War, such as the Cuban Missile Crisis and the Vietnam War. For O'Neill, economic growth is merely a product of technological and scientific advances.

The vision of space colonization that O'Neill produced mirrored the Western (American) Capitalist economy. While his speculative "A Letter from Space" in *The High Frontier* (a missive from

a fictional couple who inhabit the space coloniality to their friends on Earth) evidently transports suburban American values into space, O'Neill himself did not want to speculate on governance or social organization (199). Of course, by speculating on economic forms, O'Neill set the groundwork for what kind of social and political forms would or could exist on his colonies. Although, in *2081*, published in 1981, only 5 years after *The High Frontier*, O'Neill speculates that future colonies in deep space will have small governments with few taxes, and laments that governments on Earth have grown in scale and power. For O'Neill, high taxes would inadvertently cause further space expansion, a people would wish to be free of them. The most significant aspect of O'Neill's space colonies is the very idea that the function of a space colony is nothing more than a reproduction of an already-existing urban space in a zero-gravity environment. I can only imagine that this reproduction of an urban industrial community, full of white middle-age suburbanites, was an attempt to appeal to the American middle class (who, O'Neill hoped, would populate these space colonies). Yet, the production of the American middle class and the environment in which it expanded was not built by the manufacturing practices of the 1970s, but rather built on a blood-stained foundation by the labor, exploitation, and expropriation of enslaved Africans, dead Indigenous peoples, and exploited workers in the imperial or postcolonial sector. Although these visions of the future in space reflect the present, those who propose them often fail to acknowledge the historical debt and political and social forms that gave rise to it. For O'Neill, the prehistory of his space colonies features very little other than the desire to expand industrial districts in the 1970s (a kind of extra-terrestrial outsourcing) and a longing for a more libertarian form of government.

Like O'Neill, who produced a full vision of a future in space, Robert Zubrin's vision for a Martian future is grounded in the technical and scientific processes that will be necessary to establish a colony. Unlike O'Neill though, Zubrin's justification for Mars colonization is explicitly (rather than

implicitly) rooted in his analysis of Turner's Frontier Thesis. For Zubrin, the future on Mars is only way to save western civilization (Zubrin; & Wagner, 1996). As Zubrin put it:

Now why do we need to go to Mars? Why do we need, more generally speaking, a new frontier in space? I believe the fundamental historical reason is because Western humanist culture will be wiped out if the frontier remains closed. Now what do I mean by "humanist culture?" I mean a society that has a fundamental set of ethics in which human life and human rights are held precious beyond price. That set of philosophical notions existed in what was to become Western civilization since the time of the Greeks, the immortality and divine nature of the soul as popularized by Christianity, but it never became effective as the basis for ordering society until the blossoming of Christendom into Western civilization as a result of the age of discovery (2002, pp. 142-143).

Zubrin considers a "humanist culture" to be a society that values human beings; yet, like O'Neill, he bases his definition of the Human on a set of historically contingent, albeit hegemonically dominant, conditions. Zubrin's overreliance on the questionable validity of the "Frontier Thesis" causes him to believe that the Human is nothing more than the Human/Man. It is a matter of historical fact—one that illuminates the logic of Modernity/Coloniality that motivated the westward expansion of the American nation—that the culture of the Frontier was not a "humanist culture" that possessed a fundamental set of ethics in which human life and human rights were held precious beyond price. The "opening" of the New World is responsible for a legacy of misery and pain that was inflicted upon the indigenous peoples of the Americas and the Africans who were brought to this New World through the Atlantic Slave trade. Yet, Zubrin can claim that the conquering of the Frontier led to the flourishing of a humanist culture, because, as Maldonado-Torres writes, "one of the characteristic features of European Modernity is the naturalization of the death ethic of war through colonialism, race, and particular modalities of gender differentiation" (Maldonado-Torres, 2008, p. 4). Like Turner, Zubrin asserts that all the old ways of Europe were left behind, and frontier peoples were the makers of their own world (1996). Yet, as Grosfoguel states, the genocide/epistemicides of the Americas were founded on those genocide/epistemicides in Europe (2013).

Zubrin's version of the humanist society as seen with the New World, specifically the Frontier, normalizes War, in Maldonado-Torres' sense, and valorizes those systems that express it. In broad strokes, Zubrin attempts to theorize that the "philosophic values" of the West did not manifest in Europe or in any place that had access to Greek or Judaeo-Christian knowledge, but, rather, remained dormant until the founding of America (1996). Such an assertion depends on the colonial conceptions of American exceptionalism, and ignores those societies that were decimated through the process of colonization that produced European Modernity

Whenever Zubrin says "humanity," he truly means the Human/Man for the practices and values that he exalts are only those of the colonizer. Its excessive and exclusionary concern with only hegemonic "human being" leads to assumptions about the value of the peoples who do not fit the description. Similarly, in the case of space exploration, Schuster and Peck call for sterilization of (cis)women on the journey to Mars as, even for the first few years on the Red Planet, pregnancy could jeopardize the whole crew (2016). Such an assertion problematizes the female sexed body, instead of creating an inclusive, safe, and sustainable Martian immigration plan and technological initiative. Schuster and Peck's proposal, paired with the aforementioned call for eugenics, displays a lack of consideration for the multiplicity of humanity, bodies, and ways of being. Such theorizing around the control of bodies is not a novel phenomenon that solely affects plans for the settling of the Martian frontier, but, rather, is an enduring element of control in the Colonial Matrix of Power. This is another instance of a vision of the future in space—indebted to the myth of the Frontier—that reflects and reproduces colonial ways of being.

Additionally, Zubrin proclaims that the essential reason for colonizing Mars is to save Western civilization from "technological stagnation," which he attributes to the decline of cultural diversity (1996). For Zubrin, the Martian frontier will generate cultural diversity, which has been declining steadily since the closure of the American frontier (1996). Zubrin laments the

homogenization of culture on Earth as a consequence of the impossibility “to obtain the degree of separation required to develop new and different cultures on Earth” (1996, p. 297). Citing that technology is a needed, but also a reason that cultures on Earth are starting to look the same. Zubrin promises that the solution to this problem and the secret to ever-greater technological advances lies in the task of relocating the Frontier to the surface of Mars, which, in turn, will allow cultural diversity to flourish (2002; Zubrin; & Wagner, 1996).

Yet, Zubrin’s account of so-called cultural decline and technological stagnation appears to be genuinely misguided and reactionary. The homogenization Zubrin cites—American fast food in China (299)—is a symptom of McDonaldization: the homogenizing effect of transnational corporations, the expansion and concentration of capital, and the outsourcing of the economic relations produced from the colonialization of the Americas (Ritzer, 2008). Of course, Zubrin’s reasons for colonization follow the logic of coloniality as the solution to any perceived problem is the ongoing consumption of land and natural resources. His concern for cultural diversity seems to be subordinated to the claim that “Western humanist civilization as we know and value it today born in expansion, grew in expansion, and only exist in a dynamic expanding state” (1996, 304). Zubrin’s expansionist outlook holds true to coloniality and contributes to its movement of control and consumption. The desire for domination and expansion, regardless of the impact on that which or those who fall outside it, fails to cultivate anything more than death. Zubrin is not alone in his concern about stagnation. I.A. Crawford also writes about staving off stagnation through space exploration as the unknown stimuli will foster great technological, cultural and artistic advancements (2015). However, it is not for a lack of “stimuli” that renders Earth relationships homogenized and repetitive, but the lack of epistemological diversity due to the coloniality of knowledge. When only certain ways of thinking or knowing are accepted, even a diversity of stimuli will be severely reduced.

The Turner thesis states that democracy and technology were produced on the frontier, that progress was made on the frontier. Zubrin seeks to recreate the conditions of the frontier to “jump start” a new wave of technological advancements. This desire for frontier conditions is a manifestation of the need for capitalism to engage with, expropriate, and exploit an Outside. The structure of coloniality and capital require untapped resources to exploit and forges new dehumanizing patterns and practices to extract those resources. This is not a “new” chapter, any more than the Western Frontier was a break from European structures. On the contrary, it is a transformation of them. I would argue that both O’Neill’s and Zubrin’s visions fit within Turner’s three frontier classes, pioneer, settler, and capitalist. O’Neill’s vision held all three; Zubrin, the first two classes. In the following section, I will approach and analyze Elon Musk’s visions of the future in space, whose speculative plan represents Turner’s third class and imbeds the language of Puritan salvation narrative into a project of neoliberal capitalist survival.

Walter D. Mignolo makes it clear that the meaning of salvation—a significant rhetorical figure of Modernity—transformed from a Christian notion to a capitalist one, and from religious conversion to economic development, over the course of the development of Modernity/Coloniality (Mignolo, 2011). This is obviously the case for the Puritan mission narrative that was recrafted into the myth of American Manifest Destiny, which produced the ruling metaphor of American exceptionalism which, in turn, was reinvented, reproduced and reinforced by the Space Race during the Cold War. Since the Cold War came to an end, the champions of capitalism have attempted to rebrand their projects and companies as the natural heirs of this colonial salvation narrative, especially the Newspace paradigm, exemplified by Elon Musk’s SpaceX and his plan to colonize Mars. As Musk puts it:

I think there are really two fundamental paths. History is going to bifurcate along two directions. One path is we stay on Earth forever, and then there will be some

eventual extinction event. I do not have an immediate doomsday prophecy, but eventually, history suggests, there will be some doomsday event. The alternative is to become a space-faring civilization and a multi-planetary species, which I hope you would agree is the right way to go. So how do we figure out how to take you to Mars and create a self-sustaining city—a city that is not merely an outpost but which can become a planet in its own right, allowing us to become a truly multi-planetary species (2017).

This is Musk's rationale for colonizing Mars. To stay on Earth is to perish; to go to Mars is to guarantee the survival of the species. Ultimately, Musk's vision for the exploration of space and the colonization of Mars retains the form of the Puritan salvation narrative. Some exceptional element of America (in this case, private space exploration) will rescue the human species from "doomsday." Just as the Puritans saw the American continent as a New Jerusalem, Musk perceives Mars as a chance to save humanity and sustain capitalism. His vision of a multi-planetary human species mimics the humanist rhetoric of Zubrin. Yet, like Zubrin, Musk's use of humanist language comes across as duplicitous and misleading especially as he is a capitalist known for union busting, outlandish comments, and abusive behavior.

Despite Musk's personal hypocrisy, the salvation narrative remains a fundamental part of American culture. In many ways, the Western frontier is treated as the salvation of Western humanism, and thus the Martian Frontier is the salvation of the species. Additionally, G. Harry Stine proclaims that space exploration will save humanity from "astronomical catastrophe" (1983). The only to have hope for the future is to leave the planet and colonize the rest of the universe.

Musk is not alone in this objective of privatizing space exploration. The Newspace paradigm denotes the current trend of private companies that are investing in space exploration technology. The Newspace Paradigm represents a shift from government controlled space access to entrepreneurial start-ups and already-existing commercial companies (Salt, 2013). According to Shammass and Holen, Newspace is the arrival of capitalism into space (2019). of course, this is not necessarily true as it is impossible to separate the United States' political motivations during the Cold

War from the aims of capitalism. In fact, the Newspace Paradigm is really just a new stage of capitalist engagement with space and the reduction of humanity. As Shamma and Holen puts it, “[t]he production of carrier rockets, placement of satellites into orbit around Earth, and the exploration, exploitation, or colonization of outer space (including planets, asteroids, and other celestial objects), will not be the work of humankind as such, a pure species-being (Gattungswesen), but of particular capitalist entrepreneurs who stand in for and represent humanity” (Shamma & Holen, 2019, p. 2). What Shamma and Holen are pointing towards is the capitalist appropriation of humanity. As such, Musk is only reinforcing the colonial and capitalist ways of the Human/Man. Newspace is not producing the capitalist conception of the cosmos anew, but, rather, only reinforcing the already-existing and deeply ingrained notion that space must serve the Human/Man’s need for control and consumption. While Ormrod and Dickens regards this as the “humanization of space,” Shamma and Holen argue that it is the capitalisation of space. Yet I contend that the Newspace paradigm’s vision of the future actually represents the continuation of the coloniality of being and the coloniality of nature, which appears in the ideological forms of the capitalization of space and the humanization of space. What Ormrod and Dickens see as the cultivation of the connection between human beings and outer space is actually a technological dependence that reinforces the colonial matrix of power through a variety of space-based communications satellites. What Shamma and Holen see as the capitalization of space is actually the recognition that space is Capital’s new Outside, and thus expresses the imperatives of Modernity/Coloniality to perform exploration for the purposes of exploitation (Dickens, 2009, 2010). SpaceX and other companies of the Newspace paradigm are a natural extension of the colonial logic of the American cosmic order. As I demonstrate in the following chapter, the United States has always intended space to be another sphere of expansion and exploitation.

A recent study conducted by Platt et. al revealed that young people believe that traveling to Mars will be reserved exclusively for the wealthy, given the increase of private space enterprise (2019). This is a significant shift from the “space for humanity” social arrangements of the 1970s. The expansion of the private space sector represents an engagement with metaphors and rhetoric that do not hold the same cultural power. The looming—and increasingly present—disasters of climate change and the experience of numerous economic downturns have robbed younger Americans of the American dream. Remember that Musk believes that he will be able to populate his self-sustaining Martian colony if he limits the cost of travel to a “median house price, in the United States, which is around \$200,000,” which exceeds the budgets of many precariously-employed young Americans (2017) In this sense, Musk draws an equivalence—financial and speculative—between the prospect of becoming an inhabitant of a Martian colony and one’s chances of becoming a member of stable suburban American middle class. Platt et al note that Elon Musk’s language “communicates a vision of his audience as one that is equally anxious about the future of humanity and earth and therefore likely to participate in—or at least support—plans for human colonization of Mars (p.6).” As Shammass and Hoken point out, this human colonization is likely only to benefit the capitalist class (2019). Musk’s aspirational rhetoric about the possibility that space exploration and colonization will benefit all mankind—that prospective multi-planetary species—is little more than cheap entrepreneurial salesmanship. On the contrary, space will be exploited for the benefit of the Human/Man. Such visions of space are targeted at an audience of the most privileged of people, even though it uses the most abstract and universalizing language to promote the dream. Yet, some argue that the private space industry will eventually permit more open and inclusive access to space, along with a “humanistic/families in space” approach to space settlements. As well as an increase in legal frameworks, economic structures will provide the “essential message (that) the humanization of space is for peaceful purposes ”(Smith, 2015, p. 212).

Nonetheless, these arguments are grounded on a normalization of the violence of capitalism, which they sanitize through abstract universals that fail to include most of humanity. The Newspace paradigm's vision of the future in space resembles both the Puritan Salvation myth and the third of Turner's frontier classes (the capitalist): "salvation within your grasp, but you've gotta' pay for it." In this sense, Newspace exemplifies coloniality's oppression of nature and separation of Human/Man from other peoples as it celebrates the normalized violence of capitalism as the best of all possible ways of life and promotes Musk's Mars as the best of all possible worlds (a true multi-planetary Pangloss).

Conclusion

According to these visions of the Future, the shortage of material resources on Earth will forgotten as soon as human beings have successfully occupied space (Bainbridge, 2009b; Barker, 2015; Sommariva, 2015; Sterling Saletta & Orrman-Rossiter, 2018; Zubrin; & Wagner, 1996). Imperialism will always grow insofar the external political and economic structures are expansionist and extractivist by design. Yet, the internal drivers of this "growth" do not need to be imperial themselves to further an empire. For Americans, as Boorstin explains, "exploration and growth have been synonymous" (Williamson, 1987, p. 259). Of course, I should add that, in the American context (under the conditions of coloniality and capitalism), both words have been practically synonymous with "exploitation." Yet, the horrors of colonialism in the Americas are often disregarded in the rhetoric of space advocacy. Space advocates and entrepreneurs, such as Musk and Zubrin, fail to acknowledge the internal and continuing harm of capitalism and coloniality. The Human/Man's exploitation is a disservice to all living and non-living things. Historically, advocates have needed to gain support from the public and politicians, and so it is clear that they needed to

align their rhetoric with hegemonic positions to obtain their goals. Consequently, space advocacy often results in the support of oppressive, violent, and epistemologically reductive systems.

According to Howard McCurdy, O'Neill "sought to resolve the desire for growth with a planet of limited size" (232). Yet, O'Neill failed to grasp that the desire for growth will need to be resolved or fulfilled if the economic and cultural norms that dominated the world were not structured by capitalism. McCurdy links this to Sagan's declaration that "every long-lived technological civilization in the universe is eventually forced to become spacefaring in order to survive" (232). Like McCurdy, I am concerned about why neither of these statements offer any reflection on their normative positions or propose a truly imaginative vision of what it means to start a journey into the rest of the universe. Space exploration and colonization will not finally reconcile the contradictions of capitalist production. Those who draw on the Frontier metaphor promise that the future in space will resolve the problems of the present, even though these visions of the future replicate the very structural conditions that afflict the present.

Despite these problems, the space frontier is defended on numerous fronts: for the survival of humankind, economic opportunities, resources, "wandering curiosity," spiritual and cultural renewal, new ideas, and a variety of other earth-based justifications. Such political and economic justifications are obvious and have been stated abundantly. Not only do these justifications draw on the imagery of the Frontier, but they also cite the colonizing voyages of Columbus as a precedent for space exploration. These connections laced with coded racist language that oversimplify historical events and fail to critique the violent and oppressive systems.

O'Neill attempted to build the future in space through mathematics and engineering. Theoretical research and technical sciences are essential for a future in space, but they should not lead one to neglect the social, the cultural, the political, and the historical. O'Neill's vision

reproduced an American suburban space that reflected the social and political values of the United States during the Cold War. His own libertarian values were prominent features of his major works, even though they contradicted the very nature and spirit of human space migration. O'Neill, however, failed to grasp that, by conceptualizing the economic state of future settlements as capitalist, he laid the foundation for an unequal space society. No matter the abundance of resources, as long as these societies conform to the imperatives and forms of capitalist production, they will produce and reproduce structural poverty and oppression.

Following his examination of Zubrin's use of the frontier metaphor, James Schwartz concludes that it lacks "convincing evidence...about the benefits of settling the space frontier" (2017, p. 5). For Schwartz, the metaphor is a myth that does not have a historically accurate foundation and thus is wholly useless as a model for space exploration. Yet, the attractiveness of the Frontier metaphor reflects the fact that capitalism needs an Outside to exploit. The colonial practices of the past and their continued effects through coloniality produce hegemonic norms that encourages visions of the future that reflect and reproduce the conditions of the present. This is nothing to do with the accuracy or validity of the Frontier metaphor, but, rather, something to do with what that metaphor signifies, i.e., a conception of Human/Man as exploiter and the conception of nature as exploitable.

As McCurdy explains, "advocates of space exploration embrace a frontier philosophy that to some seems sternly paternalistic. Dominate or perish, they say. For many, it is a matter of national survival. When John F. Kennedy accelerated the space race with his decision to go to the Moon, he did so because he wanted to preserve the American way of life." Dominate or perish is the American way of life. Nationalism, either in its Western form of nation-building or in the Kennedy example of preserving a way of life, are considered acceptable motivations for risky, imperialistic,

and violent events. The American way of life that Kennedy hoped to protect was the progeny of an American way of life that raped the continent and dominated the world through the “soft power” of economic and cultural influence. Clinging to the Turner thesis perpetuates the values of an era that lacked empathy, flexibility, cultural considerations, and equity. Yet, the cultural strength of the Frontier metaphor suggest that it is one of the few ways to gain popular support for space exploration. Kennedy’s decision to go to the Moon may have been an attempt to hold fast and true to the “American way of life,” but this very ideological decision reinforces colonial forms of authority and ways of understanding the Human/Man and Nature.

Although the standard conceptions of the Frontier metaphor do not correspond to the historical reality of American colonialism, this does not mean that people will abandon it—and the assumptions that it contains—as soon as they discover that it lacks a factual basis. To unravel the layers of coloniality that bind the Frontier metaphor together means to rethink the very reasons why the United States is drawn to outer space. The Frontier metaphor has been prevalent in the space community for over fifty years, and it is unlikely that those who participate in the practices and projects of American space exploration will be eager to abandon this powerful and tantalizing metaphor, let alone confront and challenges the logic of Modernity/Coloniality that shapes most of their work (and that grants enormous cultural power to the Frontier metaphor). In the next chapter, I will examine how the logic of Modernity/Coloniality, which shaped the Frontier metaphor, impacts the forms, objectives, and imperatives of space policy, especially the Killian Formula and the von Braun paradigm.

Chapter 4: Policy, Paradigm and Public Opinion:

"I aim at the stars."

Before the age of private space companies, the US government was responsible for controlling access to space through both a civilian agency and as part of the Department of Defense (*National Aeronautics and Space Act of 1958*, 1958). The United States president guides national space policy with considerable council (Blackler, 1975; Krug, 1991; Logsdon, 2010; Sadeh, 2002). Frequently, presidential space policy responds to the political climate of the time and attempts to connect the space program to voter-pleasing rationales (Krug, 1991). Space policy is not just about responding to domestic issues, nor was it only about challenging the technological might of the USSR. Essentially, space policy is "a nation's strategy regarding its civilian space program and the military and commercial utilization of outer space. Furthermore, space policies include both the making of space policy through the legislative process and the execution of that policy by civilian, military bodies, and regulatory agencies" (Tronchetti, 2013). The relationship between the policy-setting agenda and the outcomes of these policies is not always as direct as Tronchetti makes it sound. According to Eligar Sadeh, space policy is developed in a framework that accounts for a variety of aspects that influence or are influenced by space exploration such as public opinion, rationales, advocacy, and privatization (2002). Space policy must account for the multitude of drives, desires, utilities, and political ramifications that outer space represents (2002a). As Sadeh writes, "visions of a spacefaring future where humanity settles the Solar System still captivate the imagination, but as an issue of policy space is pervasive in advancing important utilitarian undertakings" (2002a, p. xvii).

Having analyzed the visions of the future, this chapter focuses on the elements of coloniality in American space policy. Use of the frontier and other nationalistic language codes coloniality into national space policy. Whereas advocates use the history of the American Frontier to narrativize and

inspire space exploration, inadvertently reinforcing coloniality, space policy builds upon this hegemonic historical retelling and inserts the signposts of coloniality within space directives. These signposts act as guides and note the concealment of coloniality within its language and direction of the space program. This colonial imagery may indicate coloniality, but they also intimate *las Rajaduras*, the cracks that show the way to another world of worlds.

In this chapter, I will examine American space policy, presidential speeches, memorandum, early influential works by Dr. Wernher von Braun, and William Sims Bainbridge's public opinion surveys to continue to theorize the ways in which American exploration conceals coloniality in its use of language, goals, decisions and perceptions. In the previous chapter, I focused on space advocacy with the obvious exception of von Braun, because it is difficult to identify von Braun's specific and direct influence on the space program, especially when theorizing through Dr. Dwayne Day's conception of the von Braun paradigm through coloniality. The von Braun paradigm has influenced the course of American space exploration. Unlike many other advocates, von Braun's influence will be investigated in relation to policy to reveal the link between the von Braun paradigm, visions of the future, and the concealment of coloniality.

Regardless of his significance, this analysis does not begin with von Braun, but, rather, with a memorandum from February 21, 1958, for Dr. J. R. Killian, Jr, written by S. Paul Johnston, the Director of the Institute for Aeronautical Science (Logsdon, 1995). The memo entitled "Preliminary Observations on the Organization for the Exploitation of Outer Space" details the organizational possibilities for the United States' venture into space (Johnston, 1958). This memo also describes the orientation towards outer space that remains the guiding principle of American space policy: Exploitation = Exploration + Control. I refer to this orientation as *the Killian Formula*. This formulation fits the colonial matrix of power and the major aspects of cosmic orders by accounting

for method, justification, and power relations. This formula also expresses the core elements of coloniality of nature and the coloniality of being, because it articulates the relationship between Nature as Resource and Human/Man. To assume that outer space is for exploitation means to totalize and relegate it to the category of resource. Unlike earthly nature, which was transformed into resource over the course of colonialization and capitalism, outer space became accessible after this transformation. Consequently, outer space was never nature and its relation to the West is either that of symbol or (re)source.

The Conditions of Coloniality in Space Policy

Clearly, the Frontier metaphor impacts political and agency-level decision-making. Consequently, the future in space is envisioned only within the cosmic order of the Final Frontier (Clarke, 1951; Glenn & Robinson, 1980; Mazlish, 1965). Although policy is produced in a particular geopolitical time and place, the use of the frontier metaphor reveals the overarching relation of the United States to imperialistic and capitalist structures. As former NASA Chief historian Roger Launius points out, “the NASA leadership is the most persistent exponent of the frontier metaphor as a justification for the space program” (2002, p. 17). As an agency of the United States government, NASA must justify its expenditure on space exploration and remain accountable to government legislators and the tax-paying citizen. As we will see in this chapter, these politicians, and citizens support space exploration for various reasons, including nationalism and economic advancement, two significant aspects of Frontierism.

The “Introduction to Space,” a document written by the President’s Science Advisory Committee led by Killian as the Science Advisor to President Eisenhower, functioned as an introduction to outer space for “all the people of America” (1958). The purpose of this introduction was to establish initial justifications for the exploration of space by outlining four factors of space

that would construct certain visions of space that the US government would support (1958). These four factors were defence; prestige; technology, and “the urge of man to explore and the thrust of curiosity . . . to go where no one has gone before” (1958). These initial justifications fit with the imperialistic structure of the American nation-state by producing a mission-based motivation, space exploration for the “benefit of all mankind” through defence, prestige, and technology. During the Cold War, American prestige functioned as a form of “soft power.” The might of America’s technological superiority was intended to show the “Third World” that American democracy and capitalism were superior to Soviet communism. There are two major structures, militarism and the labour practices under capital, at work here that reinforce Maldonado-Torres’ theory that Modernity is a paradigm of war, that conflict is essential for exploration, that the abstract “mankind” is code for the Human/Man, and that being that is the thinker and the conqueror. Afterall, the “mankind” that will or has benefited from space exploration belongs primarily to the western capitalist nations and those people who are already accepted within those systems.

The constant affirmation of the nation-state and the capitalist economy renders the promises of “peaceful purposes” and “benefits for all mankind” null. Behind the rhetoric of “peace”/“benefits” lies the belligerent reality of Modernity/Coloniality. Such “peace” actually represents the normalization of war, of normalized violence under coloniality and capitalism. As Maldonado-Torres reminds us, war-like displays of violence become normalized because of their repetitiveness (2016). The repeated assurance that space will be used only for peaceful purposes rings hollow as it affirms an already-violent system, that of the nation-state and capitalism. The violence of capitalism is an ongoing war against the Othred peoples of the world and against nature (Maldonado-Torres, 2016; Mignolo, 2011). This is normalized in a variety of ways including space policy. The National Security Decision Directive Number 42, July 4 1982, while reaffirming the “use of outer space by all nations for peaceful purpose and for the benefit of mankind” (*National Aeronautics and Space Act of 1958*,

1958), the Reagan policy intended to “strengthen and security of the United State; to obtain economic and scientific benefits through the exploitation of space; expand United States private-sector investment and involvement in civil space and space-related activities” (1982).

Such language normalizes and conceals the inherent internal violence of the state and reaffirms the right of the state-sanctioned violence on a global scale. It also reaffirms the economic model of capitalism, which, in the Cold War context, is part of the “battle for men’s minds” that President Kennedy referenced in 1961 (1961). The language of space policy, then, is meant to unify a nation through its government’s activities, such as going to the Moon or routinizing space exploration. Although the bureaucratic and democratic nature of the United States government means that many political actors cooperate on this process of unification, the President ultimately decides on the nature of space policy (Krug, 1991). Furthermore, the logic of coloniality within American society means these choices—even when they attempt to be domestically responsible and reflect power on an international scale—often reflect and reinforce colonial and capitalist violence. This is also a product of the lack of epistemological diversity within the American imaginary. As John Logsdon writes:

the decision to go to the Moon was a choice that reflected particularly American characteristics, such as the assumption that the U.S. democratic system of government was superior to all alternatives, that the United States was rightfully exemplar for other nations, and that meeting challenges to the U.S. position as the leading world power justified the use of extensive national resources to achieve success (2010, p. 225)

The Frontier metaphor shapes and supports the principles of American exceptionalism because it assigns the United States a particular role. As such, only the U.S has the societal and political apparatuses and dispositions to produce the greatest accomplishments in space, because only the U.S. developed the means to do so by conquering the Western frontier. The U.S. has only one way of relating to the outside by attempting to control, then exploit. This worldview is that of the Final

Frontier. As the Killian formula attests, the language of exploration hides the violence. Exploration is the direct precursor to the control of the environment that leads to “profound effects on the future of nations; on their relative strength and security; on the relations with one another; on their internal economic, social and political affairs, and the concepts of reality held by their people,” as the Space Task Group wrote (1965). This idea of affecting the “concepts of reality” is the intentional construction of a cosmic order. In the case of the U.S., as we saw in previous chapters, the cosmic order comprises the Puritan influence of destiny, the genocide and epistemicide of the Americas, the production of a hyper-individualistic and controlling culture, and the innate national assumption that the American mission is the salvation of mankind. While it is no longer spiritual salvation, it is salvation from the evils of communism. In a way, this salvation intends to extend Human/Man-ness to the whole of the world and to make all men Human/Man by absorbing and integrating everyone into the capitalist framework.

Nixon’s decision to “routinize” space exploration—first announced January of 1972—began the process of the development of a “new type of space transportation system designed to help transform the space frontier of the 1970s into familiar territory, easily accessible for human endeavor in the 1980s and 1990s” (para. 1, 1972). However, it is not the shuttle itself that makes this statement interesting, but the call to use a new form of technology to change the relationship the US has had, so far, with space, from one of the Frontier to one of familiar territory. As John Logsdon states, “President Richard Nixon has no stomach for what NASA proposed—a major post-Apollo program aimed at building a large space station in preparation for eventual (in the 1980s!) human missions to Mars” (2010, p. 241). From the perspective of Walter A. McDougall, Nixon’s interest in the Space Shuttle was based on the “electoral logic of aerospace depression” in space industry-heavy states (1985, p. 423). According to Krug, “Nixon had to create a new identity for space exploration” as a “future based on current earthly priorities” (1991, p. 41). Krug touches upon the idea that the

future is based on the current climate and implies space policy (and advocacy) before Nixon did not respond to immediate political imperatives and agendas.

As I stated previously, the repetition of the present in the future is a common aspect of coloniality under the domain of authority (control). Nixon used his presidential powers to reshape the space program. No longer was it Kennedy's program; the Apollo program had come and gone. On the contrary, Nixon's new direction for space policy derived from earthly needs and demands. Although Nixon may have made these changes based on the political and social climate of the early 1970s, it does not stray too far from the condition of coloniality (as it cannot) or the Frontier metaphor. After all, the frontier did not stay the "Wild West," but, through the forms and forces of colonial expansion and genocide, the Wild West was tamed. In many ways, Nixon's policy moved space program from a place of "exploration" to one of "control." According to Killian's original idea, this control was a necessary function for the exploitation of space. Although the space program would flounder in the 1970s without a strong presidential ally, the 1980s would foreground the exploitation of space (Logsdon, 2019b).

Nonetheless, Nixon's statements rearranged the United States' relationship to space away from the one defined by Kennedy and early visions of space from von Braun, Clarke, and artists like Willy Ley (McDougall, 1985). Nixon attempted to subordinate space exploration to the social and political climate of the United States, which, in turn, reaffirmed the unique and exceptionalist notion of the nation's role in the global geopolitical arena. This follows the American pattern of confronting the edge of the world and civilizing it and pursuing this national goal for the purposes of a generic "human betterment" (Nixon, 1972). In this simple arrangement, Nixon began to define space more in terms of resource and use-value than earlier presidents. This is an interesting turn. As a result, the space program moved from one point of the "exploitation = exploration + control"

formula to another. It is important to note that the exploitation that is developing here is still very Earth-centric. Further exploitation of the solar system demands further exploration. It is almost as though the full exploitation of space requires a dialectic between exploration and exploitation and a constant and progressive state of control or perceived control. Nixon needed to address the social and political problems, while, at the same time, offer support to the aerospace industry; and so, he transformed the formerly bold space program into just another department of the United States government (Krug, 1991). As political necessity ceased to be a core motivation for space exploration, Nixon placed economic and technological justifications at the forefront of his space policy cite. Although he could do this to cater to most groups, he could not satisfy, excite, or even placate the space community(Krug, 1991). What develops over the course of the 1970s is the routinization of the space program (which, admittedly, was Nixon's goal). Steadily, the Wild West became the Oregon Trail.¹⁴¹ Yet, Nixon's routinization of space exploration established the perfect conditions for Reagan to reignite the Frontier rhetoric later in the 1980s.

What is most notable about the Nixon Doctrine is how it integrates space exploration, a remarkable technological accomplishment, and turn it into something routine. Yet, this is a move that seems to strengthen American Exceptionalism. The Space Shuttle was the chariot of the gods that the United States owned, and the President could choose who had access to the heavens. In this case, routinization increases access for more than just the government, but for private industry, and furthermore, granting more access to the to the Human/Man. The routinization of space allowed Nixon to respond to the political climate of his time and reaffirm the capitalist and colonial conditions of Western Modernity. As the Apollo program adequately displayed American control over space, Nixon felt the need to reduce programs of exploration, and instead foster forms of economic exploitation in space.

Of notable concern are the economic motivations for space exploration. Indeed, there are abundant natural resources all over the solar system. Asteroids contain enormous amounts of ore and dense metals that can be used to construct the infrastructure for Lunar or Martian colonies. Currently, the commercial space industry is proposing legal frameworks that would permit the exploitation of the solar system. Neoliberal capital pushes the boundaries of earth to await the next frontier for profit and plunder. Given the accepted language and norms surrounding the “peaceful” of the “peaceful uses of outer space,” exploitation via Capital is considered non-aggressive. No space-capable nation signed the Moon Agreement, which would have stopped resource exploitation of celestial bodies, leaving then terrestrial bodies vulnerable to capitalism. What concerns me here is not simply that capitalism will extend beyond the Earth, but also that space will be viewed as an economic resource rather than a unique environment. Employment and exploitation, as well as general business, are often cited as motivations for space exploration (Bainbridge, 2009). However, these motivations could justify any expansion, even to the bottom on the sea. Yet, these economic motivations are shaped to totalize all the worlds in the universe into a potential resource.

Whenever the frontier metaphor is used in some capacity, it is usually is oriented towards the future and the past. Take Reagan’s national space policy entitled “Pioneering the Space Frontier.” The very first statement in this text refers to Columbus and the promise of settlement in the solar system: “Five Centuries after Columbus opened access to “The New World” we can initiate the settlement of Worlds beyond our planet of birth,” as though Columbus began a virtuous mission that we must or would want to continue (1986) . This statement fails to understand the weight of its own argument. Limerick points out that Columbus expedition was “an almost immediate mess” (Limerick, 255). She notes that there was hardly any gold; “that the indigenous peoples died of disease and forced labor; and that Columbus suffered personal misfortune” (1992). Yet, I would like to reach beyond the basic facts of these historical events to the document’s assumptions about land,

value, and humaneness. These are questions of purpose, politics, and social norms. Columbus did not go to the Americas out of curiosity—despite the claims of children’s history books—but for empire and gold. This is another instance of the connection between Man as Explorer (I think) and Man as Exploiter (I conquer).

In the 1965 book *The Railroad and the Space Program*, American historian Bruce Mazlish writes that “the philosophic aspects of the space program go back to earlier developments . . . The railroad, symbolizing modern technology, signified the conquest of natural conditions and the creation by man of self-made environment” (p.41). In these observations, Mazlish is wading through the various impacts of the emergence of the railways in the 19th century on the American public. Mazlish understands the railways as the only technological advancement comparable to space exploration and suggests that the study of the railroad’s historical impact might lead to a more informed understanding of the potential impact of space exploration. As Mazlish writes, “Analogy seems to be accepted as a natural way of thinking, requiring little reflection (p.3).” Limerick refers to this as an unreflective use of the metaphor (1992). This is only a natural and useful way of thinking, because the history of genocide and epistemicide has left very few alternatives. None of those alternatives have the hegemonic power of the Frontier. Mazlish’s use of the Frontier metaphor reveals the necessity of colonial forms of exploitation and planning for the success of the state and of capital. Significantly, the seemingly straightforward technological achievement of the train—a marvel of the Industrial Revolution—performed an imperial motive, namely, the construction of a connected nation-state (Roman, 1991). Even Lenin makes this connection between imperialism and the railway when he notes that “the development of railways has been most rapid in the colonies and in the independent (and semi-independent) states of Asia and America” (Lenin, p.239). While Lenin addresses the hold of finance capital on the production of railways and the growth of capitalist economies, it is important to stress that the role of racialized labor in production of the American

railways. Railways are a technological aspect of creating capitalist infrastructure, but only after the massacre and displacement of indigenous people who once inhabited the land.

Reagan's use of the Frontier metaphor, paired with his commitment to make space available for commercial use, reappears in his speech of September 22, 1988, a few days before the first shuttle flight after the *Challenger* accident. Reagan links the United States as a nation of pioneers, as he had done with his *Challenger* memorial speech, to the ascent to the stars (Reagan, 1986, 1988). What is remarkable about this speech is the way that Reagan moves from the historical figure of the pioneer to the American destiny in the stars. Not only is his rhetoric emotionally charged, it embraces nationalism, technology, and the Puritan mission and seamlessly fuses those things with capitalism. Reagan states that commercial development will begin a "new age" for space, where private space companies will foster the "vibrancy and creativity of the free market" and where a "full range of possibilities lie ahead" (1988). Evidently, Reagan is saying that America will lead mankind to space. Capitalist expansion into space is the American destiny; it is the salvation of Human/Man. Although private companies have been involved with space exploration since the beginning of the Space Age, Reagan is suggesting that the US government has built enough infrastructure to ensure the private sector can, as they had done in the west, transform the Frontier into new land for the American nation.

Of course, what followed was not a new Space Age of the Free Market, but rather a lull. During the Cold War, space was merely a way to stabilize the ideology of capitalism. The material conditions of space exploration did not match the vast visions set forth by O'Neill. The world did not unify around the project of future life in space, as founder of the Committee for the Future Barbara Marx Hubbard had hoped (1989). Although President Bush Sr. announced a new human

spaceflight plan called Space Exploration Initiative, the cost of this plan failed to attract Congressional or international support. In the 1990s, human spaceflight took a back seat (Dick).

Following the *Columbia* shuttle accident, George W. Bush announced plans for humans to return to the Moon by 2020 (Bush, 2004a). Once again, this policy reaffirms the idea that space exploration serves the advancement of “U.S. scientific, security, and economic interests” (Bush, 2004b). While the rivalry with Soviets fostered great political interest in space exploration, the War on Terror did not. The 2000s saw renewed interest in space tourism by private companies, but none of these enterprises were immediately successful (Davenport, 2018). By the time President Obama released the 2010 “National Space Policy of the United States of America,” space was not nearly as importance or prestigious as it once was. Space exploration, notably human spaceflight, had become routinized as Nixon had desired; yet it still held the responsibility of upholding American exceptionalism by reinforcing the necessity of American leadership in space. The most significant aspect of Obama’s policy is the phrasing of one of the principles: “All nations have the right to explore and use space for peaceful purposes, and for the benefit of all humanity, in accordance with international law. Consistent with this principle, ‘peaceful purposes’ allows for space to be used for national and homeland security activities” (Obama, 2010, p. 3).

Despite the misleading humanist language, the principle represents a primarily economic justification for space exploration. “Peaceful purposes” permits capitalist expansion, as well as the defense of the nation, and thus serves the needs of Human/Man. In this way, Maldonado-Torres’s assertion that “war” is central to modernity holds true. The normalized violence of the state, of the economy and the exploitative nature of Human/Man are only reinforce in space policy, not challenged. International law about peaceful purposes is invoked to reaffirm the global nature of

capital and the impotence of international regulative bodies. The next section will demonstrate the western orientation of international space treaties and how it reaffirms global capital.

The Final Frontier and International Treaties

It is important to think through the impact of the American Cosmic Order on the rest of the “modern” world. To do this, I will examine the Outer Space Treaty (OST) and the Moon Agreement. Both are United Nations space treaties meant to regulate the use of space. The OST was signed by more than 110 nations; the Moon Agreement (MA) was signed by very few, none of which were space-capable (Griffin, 1981). In this section, it will become apparent that the American cosmic order influences other spacefaring nations and regulatory bodies to adopt the image of the Frontier and removes the ability for “allied” nation-states to resist this emphasis on exploitation. The language of the OST and the MA both reinforce the Human/Man conception of the human and the Nature as Resource configuration. This is most apparent in the uses of “peaceful purposes” and governmentally accepted extractivist practices that will later be debated as barriers to capitalism.

The Outer Space Treaty of 1967 and the Moon Treaty of 1976 are both significant international treaties, largely because they reveal much about American global hegemony. The United States, as much as any sovereign state can be, is bound by international law. The US and Russia are active partners in space, and the backbone of an international collaboration that has built the International Space Station (ISS) (NASA, 2019). Although the political and scientific purposes of the station are questionable (Cite), this international cooperation in space often serves to justify American space policy’s emphasis on “peaceful” and “common” benefits for all of humankind. Without diving into the history and function of the United Nations, it is important to acknowledge the influence of the struggle between the US and the USSR on the international body. Each nation was vying for influence and control over the global. When it comes issues of space, this influence

needs to be more than just technological. To capture the minds of men, *it has to produce* a cosmology worth investing in.

The United Nations Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (General Assembly Resolution 2222 (XXI)), commonly called the Outer Space Treaty (OST), entered into force on October 10, 1969, three months after the first humans landed on the Moon (1967). The OST is the first of the five major United Nations treaties on the governance of the activities and regulations of space exploration and represents the foundational document of the legal framework that outlines the uses of outer space. Most notably, and of great importance to this work, the OST establishes the legal standing of the “peaceful uses of outer space” (1967).

Beginning in the 1950s, the United Nations recognized that the prospect of space exploration was potentially volatile and began international activities to regulate it (McDougall, 1985). The first article of the treaty (1967) reads: “The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind” Such a statement appears to be inclusive, even equitable, yet, upon further analysis, what becomes obvious is it binds celestial bodies to exploitation. Although it seems to include underdeveloped states, the material conditions of the world at the time of the signing of the treaty meant that only Western nations would be able to access these benefits. Yet, this follows the pattern of the colonial occupation of the world. Given the history of the previous five-hundred years, it is hard to consider such a treaty to be accidental or mistaken. What becomes evident is that Western hegemony influences all things it can touch, including international law.

In this way, article 11 of the Moon Agreement states, “The Moon and its natural resources are the common heritage of mankind, which finds its expression in the provisions of this Agreement” (1976). What does this mean? “The common heritage of mankind” takes on an uneasy quality once one examines it through an anti-colonial lens. This article produces an international agreement that states that outer space can be exploited by Human/Man. Although in the case of this international policy, the abstraction of humanity functions as an obstacle.

Compare this to the first article of the Outer Space Treaty: “the exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind” (1969). This article prioritizes the nation-state over the abstracted mankind. This is likely a result of the political climate of the time as the inability to separate international political events from the Cold War meant that all international bodies were subject to this Cold War. And so, this treaty could be used to nullify any triumph in space on the part of either the US or the USSR.

Article 11, section 5 reads: “State Parties to this Agreement hereby undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the Moon as such exploitation is about to be feasible.” The feasibility of resource exploitation on the Moon was not technologically possible at the time of the writing of the Agreement, so a provision was added to re-examine this section at a later date. If necessary, the wording of this article could be altered to remain abreast of contemporary technological advances. What this international lunar regime would look like can be speculated; however, the outright disapproval of the Agreement reveals a lack of interest in even engaging with such a body. Much like nation-building justifications, like those of the United States, international engagement with other

nations reinforces the legitimacy of the nation-state, and further legitimizes its right to violence, internal and external.

While these may not appear like substantial differences between the OST and the MA, embracing the Moon Agreement could have established a completely different relationship with outer space, where the being of humanity was central rather than the consumption of the other or outside. As it sought to regulate the appropriative path that the US (and Russia) were taking in space, the MA failed because major nation-states did not see the value or advantage of it. While the US began with a capitalistic underside to its space policy, the Moon Agreement would have ceased this economic orientation and effectively stopped any nation from pursuing that course of action. This, in itself, was a direct strike against the US. Due to the Cold War, the undercurrents of capital had already been established within US space policy and culture. The economic hegemony of capitalism defined the US against the Soviet bloc; to accept a dilution of this would be unimaginable for Western Modernity. Capitalism had become synonymous with the various characteristics of US culture and history: freedom, democracy, hard-work, and individualism. To accept anything else would be un-American.

The differences between the Outer Space Treaty and the Moon Agreement display various trajectories of space-capable nations between the late 1960s and 1970s. The rejection of the Moon Agreement by space-capable nations and their allies reveal the impact of economics on the space sector. Nixon's routinization of space exploration was a necessary foundation for the rise of economic interest in space. Thus, the routinization of space exploration affirms Nixon's political agenda, the internal need for space sector jobs, and takes a turn from exploration as political exploitation to control for economic exploitation.

As former NASA administrator Thomas Paine declared in a 1969 lecture:

Looking back to the early navigators, the thing that impresses you is not the culture that they carried to continents like North and South America, Africa, Australia, and the far East, but the effects of the culture that they brought back to Europe (McCurdy, 1997, p. 164).

This is a blatant celebration of the conquest of peoples and places for the benefit of the so-called “explorers.” Indigenous peoples were coerced into labour, and the entirety of the Atlantic slave trade is founded on the desire to exploit land and peoples. This is not impressive. Millions died as Europe flourished. This sort of historical mythmaking sanitizes the history of colonialism. This is the logic that is “driving all of us toward a collective death dressed under the triumphal growth of a global economy” (Mignolo, 2011, p. 117). It is this cost-benefit analysis coupled with racism that drove the United States across the continent.

Paradigm

In the wake of Elon Musk’s bold declaration that his company would pave the way for humanity to become a “multi-planetary species,” the call to safeguard humans as a species re-entered the popular imagination (Musk, 2017). Yet, it was not a national call, but, rather, an economic and ideological one based on the new space economy. The Puritan salvation narrative resurfaces, transformed—from its spiritual roots through the economic development and secularization of the United States, the settling of the Frontier, and the expansion of capital—into a call for the survival of the Human/Man, situated squarely in the cosmic order of the Final Frontier. In this instance, Humanness is saved and defined by capitalism. Yet, before this paradigm could emerge, there was another one that was rooted in the Frontier and built on salvation narratives: the paradigm of Wernher von Braun, the former Nazi scientist who was escorted to the United States after World War Two through Operation Paperclip and was characterized by his hard work and amoral willingness to conform to the political conditions of his time (Neufeld, 2007). He was able to

establish himself in America as an engineer and visionary who set his sights on Mars (Neufeld, 2007; von Braun, 1991). Incidentally, Walt Disney and the Disney corporation contributed significantly to von Braun's success as an advocate. It was Disney that gave von Braun an opportunity to promote space exploration on national television (Neufeld, 2007).

The Final Frontier functions ideologically on various social, political, and cultural levels. Historical context is a defining aspect for how the metaphor is used and why. The political aspect of the Final Frontier manifests in policy. The von Braun paradigm is an overarching and highly influential paradigm that continues to shape and limit the possibilities of space exploration, policy, and advocacy. The social and cultural levels of Frontierist ideology manifests in metaphor and in justification for von Braun. Neufeld described von Braun as a man with a vivid imagination, but, as an engineer, he was conservative (Neufeld, 2010).

According to space policy researcher Dwayne A Day, the von Braun paradigm "is the belief that the country (US) needs an integrated space plan centered on human exploration of the solar system and involving four basic ingredients: a space station; a Space Shuttle; a Lunar base; and a human mission to Mars" (1995, p. 153). Day points out that there is nothing inherently "wrong" with this plan in itself. However, Day thinks that the von Braun paradigm did have "negative results by limiting the discourse on space policy and presenting political decision makers, most notably the President, with only limited options" (1995, p. 153). In Day's words "von Braun's vision had its greatest influence on *how the US space community envisions space* (Day, 154)." This influence lasted decades, even though much of the initial plan failed to come to fruition. The von Braun paradigm produced a discourse that reflects the patterns of the Frontier. It equates progress with movement and technology. It also links power with occupation and access: the space station as an outpost; the shuttle as a reliable vessel; the Moon as more permanent base, and Mars as occupied colony (Day,

1995, 1996; Neufeld, 2010). For von Braun, space was to be conquered, and the paradigm that bears his name reflects this. Von Braun embraces the Frontier language as it invoked both the nationalism of the time and the orientation towards conquest.

While von Braun gave us a grand vision of human space exploration, only one element is popularly recognized: the lunar Missions. The Apollo program is an aspect of the von Braun paradigm that corresponds to the Cold War political climate better than any other aspect of the paradigm. It was a boisterous display of technological might and nationalism, which bolstered the space industry. The success of the Apollo program was not solely a success for human spaceflight, but also for the Cold War. Yet, the program was a massive undertaking that involved more than government policy. Indeed, the Apollo program actually lacked public support (Krug, 1991). Over the years, many space advocates have reminisced about the wondrous time of the Apollo missions. However, this nostalgia compels advocates to pay too much attention to the funds, the mission, and the grandeur, and ignore the political realities of the era. President John F. Kennedy was not a space enthusiast who used his position to advance space exploration, but, rather, a politician who used space to serve a political agenda (Logsdon, 2010).

The term “paradigm” is used to encapsulate the central aspects of von Braun’s vision for the human expansion into space. Yet, the inconsistent use of this term reveals the very indeterminate nature of these frameworks. In a certain sense, there is only one space paradigm—von Braun—and other space paradigms have been subordinate expressions of this paradigm. The von Braun paradigm encompasses the adaptability of political climates and economic relations, in this way, Apollo was the von Braun paradigm’s political expression while the Newspace movement is the neoliberal one. These expressions are produced out of a political and economic historical context. For instance, the Cold War, American exceptionalism, and the ideological conflict between Western

capitalism and Soviet communism represent the key motivations of the Apollo Program. Yet, they are inseparable from von Braun's vision of the future in space. While Day and others have described the von Braun paradigm from an engineering and technological standpoint (and confronted the material and mechanical dimensions of going into space), their description of the von Braun paradigm fails to grasp any of its ideological or political implications. Yet, von Braun himself was more than capable of using various political and cultural events to justify space exploration, especially his exploitation of America's Cold War fears of Soviet domination and expansionism. Briefly put, the von Braun paradigm is a framework for the human expansion into the solar system. Although it may appear "political and socially neutral," this agenda can be constantly adapted to whatever political climate will enable it to achieve its own ends.

The von Braun paradigm is Frontierism. It is the very essence of Turner's understanding of the value of the frontier to American culture, and, in turn, the expression of those values. The expansion across the American continent meant *claiming* dominion over the land, not just through direct acquisition of it. The superiority of the American nation state was a necessary cultural, social, and political component. It is not enough to acquire landmass for a nation. (For instance, the Louisiana Purchase could never serve as appropriate or appealing metaphor for the American future in space, because the notion of *exploration* in the American cultural imaginary has more to do with the legacy of coloniality than the mere fact of *more land*). Such a nation must have a moral and cultural claim to assert its power and position. Winning the west fostered an image of America that would help to establish it as a powerful nation-state and prepare the way for the American century.

In fact, von Braun's vision of the future in space is directly based on the frontier metaphor. Von Braun actively and intentionally refers to space as the frontier in his first piece for *Collier's* magazine in 1952 entitled "Crossing the Last Frontier." In this article, von Braun emphasizes the peace-maintaining function of space exploration. Creating a space station would "not only preserve peace

but . . . take a long step towards uniting mankind”(Von Braun, 1952, p. 179). Yet, his focus on the peace and unity of mankind was not von Braun’s first attempt at a justification for space exploration. In fact, von Braun’s biographer Michael J. Neufeld notes that he initially wished to portray the “space station” as the “ultimate weapon (Neufeld, SS-SP, 53).” This is not too surprising as von Braun was often willing to adapt to the political climate of his time (Neufeld, 2007). Yet, von Braun’s adaptations were almost entirely opportunistic(2007) . Perhaps his opportunistic approach to space advocacy caused him to recognize the value and power of the Frontier metaphor as a rhetorical tool to persuade the American public and political class.

Launius and others have written about the impact of the von Braun on policy and visions of space for the last 70 years (Day, 1995, 1996; Launius, 2002; Neufeld, 2010). Von Braun, popular from his collaborations with Disney and *Collier’s* magazine, helped to tantalize and excite public imagination. As Launius explained, von Braun’s plan for space exploration sprang from his personal obsession with the Moon. The paradigm (Space Shuttle -> Space station-> Moon -> Mars) did not happen either in the order in which von Braun had envisioned nor to its completion, because it lost political support after Apollo met geopolitical goals from 1969 to 1972 CITE. Although von Braun’s plan failed to take shape itself, it did shape our understanding and vision for what is to be done in space and how.

The Von Braun Paradigm has had considerable influence over the policy and direction of NASA for decades. The paradigm consists of an arranged and linear plan for human expansion into the solar system. Von Braun had planned for humans to be on Mars by 1983, and though much of his direct plan failed to manifest, the influence of this plan can still be felt today (think Elon Musk and SpaceX). The use of the Frontier thesis permeated through von Braun’s advocacy. In some ways, it is impossible to separate the von Braun exploration paradigm from the Frontier thesis. For

von Braun, space was the frontier to be tamed and taken. Thus, we have these privileged men, Clarke, and von Braun, influencing the future in space, because they wanted it for themselves and justified it by claiming it for all mankind. This situation is a smaller scale version of a larger European trend of universalizing provincial or personal ideas as a global human nature.

The von Braun paradigm created the very conception of how and why the United States approaches space exploration. This conception—rooted in the Final Frontier—is that space is a political, military, and commercial realm. Von Braun's vision, an integrated plan for human exploration of the solar system, included four components that continue to direct how we understand our advancement into space: a space station, a Space Shuttle, a lunar base and a mission to Mars. Two of these four goals have been met: The Space Shuttle—recently retired—and a Space Station—still operational—the International space station (ISS). While these two technical feats have been accomplished, they were not completed as part of von Braun's integrated plan. The lack of von Braun's integrated plan for these activities causes these projects to appear politically and financially unjustifiable. The Apollo paradigm has had a more aggressive influence: space advocates are often adamant that, --if we were to just go back to the Apollo way of doing things, we could advance into space—(Zubrin, 2002; R. Zubrin, 1999). Yet, this thinking has perhaps given way to a more commercial-private conception of space exploration. The von Braun paradigm's lack of political credibility, due to its long-range and costly goals (Day, 158-9), proved to be its greatest enemy. Von Braun's "space for its own sake" was politically irrelevant; his vision simply did not fit with its time (Day, 159). In other words, the von Braun paradigm had no material base to serve as a stable foundation for resources. This limited its influence to creating an understanding of space that had no real connection to the one produced by the political realm. While von Braun was conceiving of a grand plan for space exploration, Eisenhower was producing space policy aimed at national security(McDougall, 1985).

Day, however, is not looking at the potentiality of space as a social or political space, but the ways in which we can venture into space. As Day notes, “von Braun's vision had its greatest influence on how the US space community envisions space (1995, p. 154).” That vision, buttressed by von Braun’s use of the frontier metaphor for its American exceptionalist connotations, directed, not just the space program or community, but the general public’s understanding of space and how we might “use” and colonize it. And while von Braun believed in space exploration for its own sake (1995, p. 153-4), his vision had to contend with the political, and later economic, agendas of the US government and the space community.

If the Killian formula is $\text{Exploitation} = \text{Exploration} + \text{Control}$, then the von Braun paradigm is the long-term plan for exploration. The von Braun paradigm sought a holistic engagement with the solar system. Instead of exploiting piece by piece, exploitation would come after the complete exploration of the solar system. This is likely a consequence of von Braun’s actual interest (or dare I say, love?) for space exploration. Yet, von Braun offers an example of how all of us are caught in systems of exploitation as both a victim and a perpetrator.

For von Braun, his vision was the most logical, accumulative, and human-centric way to venture into space. He even saw himself leading a mission to the Moon (Neufeld, 2007, 2010). The execution of von Braun’s vision would have put human beings on Mars by the 1980s. According to Day, “The von Braun paradigm makes sense if one is interested in developing a space infrastructure that is too big to be abandoned—in other words, if one wants to make it politically costly to shut down such a big program once started (1995, p. 158).” These “too big” and “costly” notions would indicate that space infrastructure has some un-abandonable purpose. However, Day’s argument that “space for space’s sake” as an aspect of this paradigm shows von Braun’s lack of political savvy. To justify such a large budget, the infrastructure would have needed some other purpose beyond

exploration. And so, Day concludes that “von Braun advocated a vision of space exploration later adopted by NASA that was fundamentally unworkable from a political standpoint” (1995, p. 159). The von Braun infrastructure for manned space exploration, with its lack of political (or economic) purpose was never fully adopted. The ideas of the paradigm, however, were. It is odd that this apolitical paradigm was fundamental to the political climate of the 1960s and early 1970s. Even its very technical and exploratory aspects were later integrated easily into the neoliberal paradigm. This is because the von Braun paradigm was never political or socially neutral; it was always structured by Modernity/Coloniality. Day was not examining the paradigm for its international and colonial conditions. Most space researchers are not. Even in the history of space exploration, the frontier is a metaphor, not a condition that represents something else.

The uneven adaption of the various aspects of the von Braun paradigm has everything to do with the changes to political and economic climate since von Braun first wrote for *Collier's*. The nationalist aspects of the paradigm were embraced during the Cold War, then abandoned once capitalism had “won.” Following the spread of neoliberalism, private industry continued with the most elusive of goals: the colonization of Mars. While the technical side of the von Braun paradigm belongs very much to von Braun, its cultural and motivational features stem from Manifest Destiny, the logic of capitalism and the colonial definitions of Human/Man and Nature.

“The exploitation of any unknown areas involves two distinct objectives—one, exploration and two, control. The first is largely a scientific operation and the second largely military” (Johnston, 1958). Short, simple, and colonial. Those very words lay out the blueprint for the future through the logic of coloniality—the control and exploitation of nature and humanity. This formula conveys the intent of a cosmological order for the entire universe based on state violence and extractivism. This cosmology filled with American meaning and symbols—was most easily expressed through

American imaginary and values just to reinforce the hegemonic elements of American socioeconomics for the rest of the world to see. This in itself showed the significance and superiority of the United States to its allies and enemies during the Cold War. Policy could be successful only if it fit the political climate, the national culture, and the American self-image. All three were products of the colonial matrix of power—those epistemicides and genocides that constituted Modernity. This can be seen in a 1960 Congressional report entitled “The Practical Values of Space Exploration” states concisely that “from the point of view of economic stimulus and continued commercial dynamism, space exploration should be—and proving to be—a godsend” (1960) In this sense, outer space adds much to the national and international discourse on the superiority of the American democracy and capitalism. The replication of the Killian formula in space policy is not surprising as the colonial pattern was set with nationalistic language, Puritan chosenness, and the Frontier metaphor (its history and constant reinforcement).

The Frontier Metaphor, and with it the von Bran paradigm, are so persuasive and powerful that almost all presidents have continued to use it. Without a doubt, it is the word that encompasses all that is American: the powerful sense of hope and individualism, the willingness to move forward, democracy, the dehumanization of millions, the normalization of violence, and self-serving destiny. The use of the frontier metaphor in space policy is only a hint at the “reality” of the Final Frontier. Yet, it is not advocates or policymakers alone that construct and reinforce the coloniality within space exploration. The American public also contributes to the discourse and popularity of ideas and paradigms. After all, it was Dr. Dryden who concluded that “We must not underestimate the significance of space exploration to the ordinary citizen in every country” (Dryden, 1961). In the next section, I will examine the connection between public perceptions of space exploration and coloniality will be explored. I hope to demonstrate that the coded language of coloniality manifests within public opinion in a variety of ways.

Public Perception

In the early 1970s, the sociologist William Sims Bainbridge wanted to understand what motivated the American public to be interested or invested in space exploration. At this time, there were no major studies that focused exclusively on this question (Bainbridge, 1991b). Bainbridge's first survey was a smaller one in the 1970s, which he followed up with surveys in the 1980s, which, in turn, he revisited in 2009 with his article "Motivations for space Exploration." The "back to the future" approach, writes Bainbridge, "will help us extrapolate trends in the declining plausibility of many classical justifications for space exploration (1991, p. 515)." He divides these goals into two categories: "18 broad near-term practical goals" and "16 more philosophical or distant goals (p. 514-517). As these categorizations match the domains of the colonial matrix of power, I will analyze them for symptoms of the logic of Modernity/Coloniality.

Although the Cold War undoubtedly impacted the American public's perception of space exploration, Bainbridge notes that participants mention more philosophical motivations for venturing into outer space. The early notion that space exploration was a sort of cosmic destiny with unlimited potential for humankind seems to exert a kind of pull on the imagination of the participants. Yet, it will be better for me to demonstrate this by undertaking a close reading of Bainbridge's surveys.

Bainbridge designed S1986A to "elicit utterances about the value of the space program. To accomplish this, the survey contained eight fixed choice items with space for participants to add for comments that explained their choices (1991, p. 64). This survey consisted of two parts. The first section contained issues such as "manned versus unmanned spaceflight, the space station project, the Strategic Defense Initiative, the exploration of Mars, and the far-out idea of communication with extraterrestrial intelligence" (1991, p. 64). The second section contained open-ended items, such as

the question: “In your opinion, what is the most important reason why we should continue the space program,” followed by the questions: “Can you mention a very different benefit of the space program,” “Some perfectly valid and important justifications for the space program are often ignored and deserve greater mention than they commonly receive. Can you give us such a justification?” and “Can you mention a possible long-range result of a vigorous space program that would eventually be significant for humanity?” (1991, p. 65). Once Bainbridge had acquired a thousand responses, he sorted them into general categories and arranged the utterances that became the one hundred and twenty-five items that produced the following S1986B. These categories and utterances provide a great deal of material that reflects the coloniality of the Final Frontier. From the economic value to the idealistic rationale, colonial imaginary appears repeatedly. Yet the phrasing of Bainbridge’s questions demonstrated his assumptions about what might be a possible, realistic, or rational plan of action in outer space. For Bainbridge, goals that aligned with capitalist structures were more realistic than those goals that envision, however imperfect, a positive future of sustainability. (This is evinced by Bainbridge’s interactions with Barbara Marx Hubbard’s Committee for the Future and the American Institute of Aeronauts and Astronauts that formed the basis of these survey, yet the history and meaning of these exchanges falls outside the remit of this project and will have to become a subject of my future research). Bainbridge considers that more idealist goals are linked to the emotion, where practical and material goals are associated with the scientific and the economic. Although Bainbridge ranked the “reason value” of each goal, I am not considering this as a major aspect of my analysis, as I am looking at the repetitiveness of colonial goals and imaginary.

The utterances that Bainbridge collected from his survey appear to depict a wide variety of motivations for space exploration. These motivations vary from “space is ‘full of mystery and wonder’” (128) to “the space program is essential for national defense” (Bainbridge, 1991). Yet,

many of these motivations reinforce the conception of the Final Frontier and demonstrate that the public's perception of space has been influenced by the logic of coloniality that is constitutive of Modernity.

The results of the S1977 survey reveal an increase of the association between space technologies and information and knowledge (Bainbridge, 1991). This had much to do with the increase in space communication satellites. Many of the utterances connected space technology to navigation, power generation, environmental control, and applications for industries (390). Even as early as 1977, space technology was association with the production of knowledge. One utterance states that, "space will be of value in ways we cannot yet imagine" (1991, p. 40). In this turn of phrase, the link between knowledge and technology is endowed with a form of faith. As Walsh writes, "Technology and artificial intelligence are today facets of the domain (coloniality of knowledge) that is taking over (from the religious formation of knowledge)" (Mignolo & Walsh, 2018, p. 197). This is one of the expressions of Puritan salvation's secular tool (Bellah, 1992). In this case, the framing of (the then) Soviet space program as dangerous to this America's mission fits with Walsh's observation that Euro-centric cosmology was based on the Christian Europeans' "conception and image of the world [as] only their own conception and image of the world, and not the representation of a geohistorical ontology of the world" (Mignolo & Walsh, 2018, p. 194). If technology is the secular form of the Puritan mission, then the knowledge that produces it, as well as the knowledge produced by it, holds a cosmological power. As European cosmologies totalize, dismiss and murder other ways of knowing and being, that knowledge is taken as Truth rather than one of the many possible truths.

The cluster of the survey revolves around several colonial conditions: totalizing expression of capitalism; the celebration of technoscience, and the right of Human/Man to control other

worlds. This is exemplified in the utterances: “Limitless opportunities could be found in space” (1991, p. 67). This is the exploitative orientation of Western hegemony. Limitless opportunities may have a number of possibilities: limitless resources, limitless growth of industry, limitless space to colonize. For Turner and Webb, it was the untethering of limits on the frontier that allowed for American democracy to flourish. Whereas the American Frontier was limited by the Pacific Ocean, outer space—once it has been totalized into resources for consumption—does not have a known point of cessation. Within this cluster, many participants placed a great deal of “faith” in the unknown, and credited Columbus for carrying out an exploration with benefits that he himself could not have imagined (Bainbridge, 1991). This limitless approach to space within the Final Frontier only provides limitlessness to capitalism: endless material resources, new sources of energy, and the ability to expand industry. The limitlessness does not extend to epistemological orientations or ontological potentials; this is only limitlessness of exploitation. It represents new ways to consume, rather than new ways to engage with the peoples and worlds we may encounter.

Not only did the 1977 survey show public engagement with totalizing aspects of Eurocentric epistemology, it also revealed that the public was aware of the economic and industrial potential of space. From the necessity of the space program as a sector of the work force itself to the space sector as always producing new jobs, the connection to capitalism is clear. The focus on industrial work mirrors that of 1970s Americana that O’Neill embraced as the norm (Bainbridge, 1991; O’Neill, 1977). Yet, this is not a surprising discovery as the valorization of the capitalist economic was a major aspect of the Cold War and coloniality. In the same cluster, two motivations for space exploration, the mining of raw materials and the potential for endless economic growth (1991, p.143), reinforce two major colonial conditions of the Final Frontier: Human/Man is an exploiter and all things outside of Human/Man have the potential to be exploited. What this means is that the conception of the Final Frontier is not only accepted by the public, but it is also reinforced.

Although these economic qualities are a worthwhile matter of consideration for a survey about the public's opinions and attitudes on space exploration, it is important to note that Bainbridge considers these motivations to be politically significant and persuasive. In this sense, Bainbridge—and the wider American public—feel that these colonial elements are part of a hegemonic common sense. Yet, the defining form of colonial economic practices is as follows: to be human is to exploit; to be nature is to be exploited. The Puritan theological aspects intersect with the economic and the epistemological to reinforce Frontierism.

While the motivations of technological progress and scientific discovery appear to be neutral and objective, they are driven by the material conditions of capitalism. Exploration, the production of knowledge about an environment, is a precursor to the exploitation of that environment. Despite the soundness of the scientific method and the productivity of technological advancement (Bainbridge, 1991), this is only a consequence of the role of Human/Man as Explorer/Exploiter and his orientation towards the universe as one of consumption. The very existence of these kinds of exploitation and consumption is a product of the Human/Man's assumption that he remains Outside of his Cosmic Order.

In Bainbridge's surveys, only those justifications that have been normalized by the paradigm of war, capitalism and the Human/Man are held to be realistic. For Bainbridge, the exploitation of space can create wealth, produce jobs, save the Earth environment, and have endless commercial applications (Bainbridge, 1991). As Maldonado-Torres writes, "Like colonialism, coloniality involves the expropriation of land and resources" (2016, p. 17). As Bainbridge's surveys convey, even the American public reinforce conceptions of nature as resource. Whether these opinions come from exposure to advocacy or policymakers, it is difficult to say. Yet, their provenance does not necessarily matter. Regardless of who spread them, these justifications are accepted and internalized.

When Human/Man is acclaimed as Explorer, he is accepted as Exploiter. When space is rendered resource with no other relation to it, then it is totalized for the economy. The economy becomes the central aspect of all relations. When the economy become central, the Human/Man is constructed in relation to the material conditions. This is a trap for humanity as the exploitation of the subhuman/nonhuman and the reduction of the exploiter—when embraced by the American public—reinforces that genocidal characteristics that have accompanied Modernity since 1642.

Sometimes, there is a pseudoscientific reason that Man is Explorer that almost borders on the spiritual. Not only is Human/Man an explorer, he is a wanderer and adventurer. In these utterances, themes of adventure are prominent. While these ideas may not appear as explicit capitalist or colonial goals, these motivations possess a colonial component: adventure is the narrative of turning exploration into exploitation. The notion of human as explorer springs from the denial of colonial violence on the part of those involved in the Age of Discovery: Columbus, Cook, Magellan. Their violence is justified as the violence of the nation-state has the right to defense and violence of its own sake. What this reinforces is the conception of the nation-state as legitimate, which legitimizes the Human/Man as the abstract human who can use force justly. The belief that space exploration is the continuation of the best of the Western tradition is something else that appears in this public discourse. This glorification of the western tradition is often coded and cloaked in white supremacist language, regardless of intent (Berlet & Lyons, 2000). In his critique of Kant, Mignolo points out that the Enlightenment's philosophy of history contrasts Western progress with the backwardness of "primitive" nations without acknowledging that the former's accomplishments derive from the exploitation of the latter. Furthermore, Mignolo contends that this "progress" does not have anything to do with the future as futurity. In fact, the Western tradition exults the What Has Been rather than the What If. And so, the public discourse on space exploration promotes the What Has Been, which has been masked as the future.

Other utterances suggest that Humans/Men will evolve through their encounters with the space frontier, which appears to be an iteration of the Frontier thesis. Such beliefs imply that to develop to full “human potential” we must encounter the cosmic unknown, even though this so-called development emerged from the denial of humanity and denial of our connection to the natural world. The advancement of science or the limitless resources of space are not objective points of understanding, but ways of understanding a world which is alien to us.

None of these utterances, hopes, and dreams dissolve the powerful rhetoric of the Final Frontier, nor do they contest it. They are passive affirmations of a hegemonic sphere that holds genocide and epistemicide as central to its power. The examination of public opinion shows that the Final Frontier is a part of the collective conscious, whether it is the affirmation of rhetoric or acceptance of conditions. The impact is evident. The participants of the Bainbridge survey responded to his questions through the condition of coloniality. There is an element of hope some in these answers, yet the phrasing of Bainbridge’s questions and conditions that shape the consciousness of the American public do not an opportunity to articulate this hope in a truly revolutionary way. Consequently, Bainbridge’s findings on public opinion affirms the colonial discourse. In closing, I quote Bainbridge’s summary of what he considers to be the meaning of his study: “the major classes of space goals reflect the general values that humans possess. The technical goals express everyday desires for economic gain, improvement in our technological capability, and the increase in practical knowledge. The present moment shines with the promise of an end to war and this dissolving of military motives into international cooperation although the world has known disappointments before. Idealistic goals resonate with a variety of human emotions and harmonizes with movements towards social progress across a wide compass. Colonization would mean nothing less than a fresh start, not only for human society but life itself to be reborn endlessly on distant worlds” (Bainbridge, 1991, p. 226)

Conclusion

The replacement of the Frontier with Tumblr as a manoeuvre to gain public support still manifests in motivations and structures bound to socio-cultural contexts. Once the social, political or cultural impetus is no longer valued or central, the entire structure of space exploration will be impacted, exemplified by the decrease in funding and public support after the United States succeeded in landing on the Moon before the USSR. The Space Race had been won. The funding for NASA reflected—not the values of the Frontier that so many advocate claims is curiosity and adventure, but rather, this loss of political relevance.

I included a discussion of Bainbridge's surveys to show that the Final Frontier, with its colonial and capitalist associations, existed beyond pure policy or space advocacy. Coloniality is not an official government policy; there is no agency dedicated to the conditions of coloniality. Coloniality shapes and constrains hegemonic material and cultural conditions of the world; it is the normative state of Eurocentric patriarchal capitalism. These conditions determine the values and ideas of ordinary people, even those without a direct link to, or vested interest in, space exploration or capitalist expansion. The popular and common justifications for space exploration within the colonial matrix of power reveal the invisible elements of coloniality within the popular imagination. Admittedly, these popular discourses about space exploration have been influenced by earlier attempts to popularize space exploration by von Braun and others. How those justifications have endured in the popular imagination and continued to develop with the changes of capitalism reveal the relationship between this discourse and coloniality. The Final Frontier, then, is not popular simply because a few men attempted to influence the American government. On the contrary, the staying power of the Final Frontier springs from coloniality. The Final Frontier fits and reinforces America's fundamental understanding the world, the cosmos, themselves, and its place within it. Through the public discourses and justifications for space exploration, the logic of coloniality is

made visible. While the popular perception of space exploration has been influenced by policymakers, politicians, and prominent figures, it is never wholly divorced from the logic of coloniality. As the current system of the United States is a product of the colonial impulse and the spread of capitalism, it is only logical that visions of the future, even those in space, would be bound to the material conditions and hegemonic expectations. It is almost ironic that the Frontier metaphor continues to produce the What Has Been, even as space advocates and politicians use it to describe a future of unlimited possibilities. The Frontier metaphors persists in policy, paradigms, and public opinion, because it clings close to a deeper logic of Modernity/Coloniality. Yet, I believe that it is possible and necessary to disrupt, sabotage, and escape this colonial logic. It is time to translate this critique of the Frontier metaphor into a form of praxis

Chapter 5 : Cosmic Hope⁴

“*Everyone is dreaming in this country, Now it is time to wake up...*” – Subcomandante Insurgent Marcos, August 1992.

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

⁴ Note: This chapter is written mirroring the poetic writings of Gloria Anzaldúa. It is meant to weave in and out.

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

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

Cosmic Revolution is the necessity of adapting to the material conditions of space. It is the active formation or reformation of ways of being, seeing, and doing. It is the working through uncertainty, and "rewriting reality" (Anzaldúa, 2015). Within Cosmic Revolution, there is the *El*

Mundo Zurdo: the world of many worlds (Anzaldúa, 2015; Anzaldúa, 1986; Keating, 2008; Marcos, 2006). The Cosmic Revolution is fighting for possibilities on this world and on others. It rejects von Braun's future and the Killian formula, and moves beyond western civilization. Yet it does not create the opposite of those futures, formulas, or cultures, but, rather, transcends them. It embraces the best aspects of Modernity, while rejecting its oppressiveness. It is welcoming of old and new epistemologies.

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

What is the hope of the future? This world is on fire, yet space could become the source of salvation for capitalism. This is a possibility of Not Yet. There is potential for things to go terribly wrong. Yet, through an engagement with Cosmic Hope and awe, space exploration can become an engagement with *Nepantla* that leads to different worlds, both physical and conceptual. This Cosmic Hope is a form of decolonized hope—a hope that cannot yet exist in its fullest sense. Cosmic Hope is a revolutionary praxis that grows, that blooms from the cracks of the colonial and capitalist world paradigms. Cosmic Hope grows from *Las Rajaduras*, the possibility of truth to come out of untruth. It is a Hope of the Not Yet; it is a Hope of those long dead and those yet to be born. Coloniality is a

darkness, but a darkness that, like the darkest of nights, shows the distant lights of the stars and planets so far away. The stars are like *Las Rajaduras*. To see them, you must be in the darkness. That is what this work has attempted to do: to define the darkness that is coloniality yet reveal the stars that can show a different world. It is only in darkness that the stars shine bright. In the words of Paulo Freire, “The dehumanization resulting from an unjust order is not a cause for despair but for hope, leading to the incessant pursuit of the humanity denied by injustice (Freire, p. 91-92).” It is from this perspective I move forward. Freire, again: “Hope is rooted in men’s (sic) incompleteness, from which they move out in constant search—a search which can be carried out only in communion with others (p. 91).”

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

Cosmic Hope

Cosmic Hope is possible through practices that are actively striving for another world. It is both an emotional expression of, and active participation in, changing the world. It is also the acceptance that fluidity and interconnectedness are desired central qualities of social and political forms.

Becoming open to possibilities and to infinite ontologies and epistemologies is one of the possibilities of space exploration. Cosmic Hope engages and represents the revolutionary potential of space exploration. Cosmic Hope is part of the answer to the enduring question: “what is to be done?” I anticipate that the new worlds we shall someday encounter will be built by those who experience them with the tools of that world and of that time, cognisant of the oppressions and histories all peoples have faced, not merely the Human/Man, but all people beyond the Eurocentric conception. The precondition of Cosmic Hope is the deconstruction, dismantlement, and destruction of the single relation of exploitation. What cannot take place is for humanity to bring the tools of earth to the cosmos. Terrestrial tools cannot build a cosmic house. Yet, what does it mean to write of Hope in a world of madness?

If Cosmic Hope is the engagement with *Las Rajaduras*, then it is also an engagement with imagination and with awe. The use of Frontier imagery in space exploration functions as trap for the imagination, as it mirrors and reinforces only relations of exploitation. By engaging with the contradictions and dehumanizing conditions of coloniality, and discerning its limits, the imagination is liberated to find or create other forms of relations. Imagination free of the frontier is imagination free of death. In many ways, Cosmic Hope is the fight for life. It is the will of oppressed people to take their lives into their own hands, to resist control by systems that do not benefit them. Cosmic Hope is in every weapon handled by those fighting for love and humanity. It is a form of decolonial

love, which includes “a posture of violence towards Western Modernity and the matrix that supports and legitimizes it” (Drexler-Dreis, 2019, p. 136)

Cosmic Hope is a form of reaching out. It is a decolonial shift, for, as Maldonado-Torres puts it, “building bridges is a technology of decolonization” (Maldonado-Torres, 2016, p. 30). Cosmic Hope is not simply the building of bridges between organizations and groups, but also a force that changes the ways of being and knowing of those on either side. Whereas Modernity/Coloniality is the expression of false creation, Cosmic Hope is an attempt at growth, at blooming, at building. It will be imperfect.

How, then, does the transformation of the colonial cosmic order take place? Under techno-Modernity, the cosmic order is no longer simply a system of symbolic actions and relationships. Indeed, with the technologically produced access to outer space, what was once only myth and metaphor becomes experience and relation. The continuing form of the colonial cosmic order, as previously established, is Exploitation = Exploration + Control. How might this be reimagined? What is the cosmic order of a future that embraces the decolonial and transmodern? Outer space is a harsh environment for which humans did not evolve. This reimagining and reformulation of the cosmic order cannot be pure utopian fantasy, nor can it be one person’s speculative attempt. And yet, given the grounds of this project, I must, as an individual, offer something. Yet, I understand that my speculation must fail. It must fall short, because overcoming the Final Frontier and building the future requires many peoples, many epistemologies, and many hopes. Decolonization is a collective engagement with each other and the world; it seeks to ask and live those questions that Modernity/Coloniality devalued. This chapter is split into three sections; these sections do not parallel the Killian formula. I walk away from it. One of the essential, unanswered questions raised in rethinking space exploration deals with a fundamental concern: Why go into space at all? Given the connections between space exploration and capitalism and colonialism, is there a motivation for

migrating to outer space that is not implicated in this logic of coloniality? Despite this history of the use of cosmos for cultural, social, and political practices, I do think that there are numerous reasons to venture into space. How that looks and what will come of it exceed my powers of speculation. The future in space belongs there—in the future—to those who create and live in the future. I cannot be, nor want to be, the architect of the future in space. After all, the only tools currently available to me are those of the master. This work has been my theoretical attempt at dismantling those technological and political forms that built the path to the Moon. Yet, that path ends in death. The visions of von Braun and the mid-century thinkers founded a death march to the apocalypse. And so, we must question the forms and norms that we might take with us into outer space.

Deep and strong ideas have been projected onto the cosmos and reflected back to Earth. From ideas of immortality to the ultimate escape of this earthly coil, outer space has held all hope and all hate. The development of Western Modernity/Coloniality could lead us to such a limited future: a forever exploitative understanding of the human and a forever destructive relation to nature. Yet, this future is not set in stone. That future is the one where there are many worlds, but only way of experiencing it. No, the future does not have to be as repetitive as some have made it. The stark silence of space has been drowned out by a thousand sounds of war, hatred, and fear. But, if, just for this moment, we let the silence roar, we can hear one voice, a voice urging us, as a planet, to stop struggling with rebuttal, to stop replying, to “walk away from the riverside,” in the words of Gloria Anzaldúa . It is time for a new creation. Outer space can hold new relations of humanity—not of the exploiter and the oppressor—and a completely different formation of distribution and social relations. This whole work has been a critique of the existing conditions of space exploration, of the future. This critique comes from a place of deep and unfathomable love. This chapter is my dream for space. Rationality will not lead the way into space. It is in this silence that a new cosmic order may emerge. The Final Frontier with its formula: exploitation= exploration + control is an

unwelcome earthly condition. In this way, this cosmic order destroys its own future through internal contradiction.

We must consider that the constructed relationships and ways of knowing can and do reinforce conceptions of humanity and in turn, nature. Without turning away from the colonial forms of humanity and nature, we cannot envision a future that is more than the past and present repackaged. In *Capital, vol. 1*, Marx wrote that human relations to nature can be understood through technology (2013). The imagined technologies produced for the many, yet strangely repetitive visions of space, have been premised on control and exploitation. American space orientation has been: “What can this encounter with this or that in space do for me?” Cosmic Hope situates space exploration not through consumption, but through the engagement with the experience of being.

Cosmic Hope is incomplete, and it must remain so. It contains Anzaldúa’s declaration that “rigidity means death” (1986, p. 101). Undoubtedly, the future cannot be made by the vision of one person. Trapped within the colonial matrix of power, the imaginative works of futurists and space advocates failed to create anything more than more “perfect” technologically advanced futures. These futures failed to encompass most of the living beings on the planet. These futures were grounded in technological progress as Progress. This does not produce a distinctly different comprehension of the “human” or “nature.” The colonial imagery that plagued Modernity and its technological-capitalist infant, space exploration, appears so fundamental that to remove it would seem to destroy the very thing itself. What imagery can resurrect the cosmos from the Western colonial imaginary? Perhaps outer space is already too colonized. It is a colony, a technological haven, for coloniality to reproduce in a distinctly new environment. Outer space is an intimate partner of the planet Earth. There is no other way. To go into space without the colonial intent or the conditions of coloniality is not impossible. In fact, given the research of Ben Finney who states

that space communities must be collectivist to survive, community in space can only be sustainable if it is decolonized. It is my understanding, then, that a decolonial definition of humanity and nature is necessary for the very existence of a space civilization. The very physical environment of space is the material condition that could produce this change. It is not, however, a given. Space civilizations could—in an attempt to regulate the harsh conditions—swing towards a more authoritarian form of political and social order (Cockell, 2015). This is why a vision of the future that understands and critiques the colonial conditions of Western Modernity is needed to direct the future away from a hegemonic drift and towards a humane revolution. What cosmic order encourages and connects all cosmic orders? How can we all be human? And how can all things, including culture and politics, be nature?

As mentioned in previous chapters, the Killian formula is one rooted in the capitalist mode of production, which need colonial forms to expand and function. What the Space age is a labour force for exploitation either at the source of the “resource” or en route to it (like the Atlantic slave trade). Without this dehumanizing component, full exploitation of space is not possible. Current conditions of capital, which form a circuit of exploitation, shall not be the aim of a vision. It is to re-imagine the ways in which all peoples might live on earth and in space. It is far too easy to get lost in fantastic ideas about the future; it is harder to get there. What space exploration offers can be a possibility of change, which will be forced on Human/Man in his encounter with harsh environment of space. To engage with this change, with Hope and Awe, is not to reproduce systems of oppression, but to produce wholly new and different socio-economic and political structures. Unlike the Killian formula, where the intention is already set and produced (exploitation), Cosmic Revolution is an opening for the variety of possibilities, and the production or re-ignition of ways of knowing or being. Hope is not a simple emotion. As Bloch says, “Hope is thus ultimately a practical, a militant emotion, it unfurls banners. If *confidence* emerges from hope as well, then the *expectant*

emotion which has become absolutely positive is present or as good as present, the opposite pole to despair” (1996, p. 112).

The failure of space exploration to produce a space-faring civilization stems from a lack of engagement with the darker side of Modernity. It is the failure of the architects of space to see that those conditions that actually produced western Modernity are essential for the continuation of Modernity into space. I do not want the Bezos, Musks, and NASAs of the world to create the oppressive labour relationships and extractivist practices in space for them to succeed in their projects. They are not practices of Cosmic Hope. But to create and affirm structures that elevate life, it is necessary to draw on the sense of Cosmic Awe.

Cosmic Awe

If Cosmic Hope is the action, Cosmic Awe is the experience. Reconceptualizing relational forms must be an ongoing process that is always present in negotiations and understood as a holistic practice. This is why understanding the possible impact of space exploration on humanity can increase the sense of belonging *to* the universe. As the Western self-conception places Human/Man outside, and above nature, then the experience of being part of it can change that perception. Research on the Overview Effect has identified that “the most prominent aspects of the astronauts’ reported experiences, namely: (a) appreciation and perception of beauty, (b) unexpected (even overwhelming) emotion, and (c) an increased sense of connection to other people and the Earth as a whole” (Yaden et al., 2016).

The Overview Effect, as it is laid out here indicates several things. The first is aesthetics. This sensory experience is embodied. The second is the emotional reaction to space flight and the third is the outcome of new relations based on that experience. These three qualities are arguably counter-hegemonic in that they are more intricately connected to western conceptions of femininity

than to masculinity. The observation of global interconnectedness is not unique to astronauts but is an oft-mentioned condition in anti-colonial and feminist theories. This interconnectedness is not hierarchical—the Final Frontier orientation—but instead views the world as an ecological system that “considers the complexities and the totality” (Merchant, 1996, p. 88).

To be outside Modernity is to be within nature. This is a position on the border, as Anzaldúa would say. It is only from this place that alternatives can be imagined. It is from this place that Anzaldúa said that the *Mestiza consciousness* can develop (1996). The *mestiza consciousness* is a consciousness produced out of living with contradictions of identity and place (Anzaldúa, 1986). This is not to say that *mestiza consciousness* and the Overview Effect are the same. One is a direct result of experiencing the space environment, while the other is a result of living in a colonized body in a dualistic culture and existing in the colonial wound. Yet, it is from this place that conscious rupture can happen. If the Overview Effect can cause one to experience the holistic reality of the cosmos and the world, this is similar to conception of “Mother Earth [as] a living dynamic system made up of the undivided community of all living beings, who are all interconnected, interdependent and complementary, sharing a common destiny” (Buxton, 2017).

The reduction of the universe to a source for the factories of capitalism chained both humanity and Nature to a single understanding of what each of them were and severed the relationship between them. If rigidity leads to death as Anzaldúa states, such a reductionist relation is this rigidity of the American colonial cosmic order. The multitude of ways that one person, a culture and biological group can relate to and with the cosmos should be as fluid and complex as possible. What coloniality and capitalism have done is produce a set of relations that, according to Marx, control the people instead of the people controlling the system (2013). In the case of the American Cosmic Order, the future is produced out of the systems of capitalism and coloniality, and this reduces all possible futures to those of exploitation. Embracing different ways of experiencing the

world and engaging with them and affirming them can allow transmodernity to bloom.

Transmodernity is a “planetary vision in which humans are beginning to realize that we are all (including plants and animals) connected to one system, which all of us are interdependent, vulnerable and responsible for the Earth as an undividable living community” (Ateljevic, 2013). If astronauts can experience this life-changing vision even when they inhabit the already-existing cosmic order, then it demonstrates that the Final Frontier trope not only limits ways of being and thinking but does not prepare us for the multitude of possibilities offered to us by the cosmos.

In this way, the Final Frontier fails to adequately produce peoples for the space environment. What is needed, then, is what Arturo Escobar calls a *socionatural world*: “An understanding of the complexity of relations between the biophysical and the human domains (physicochemical, organic, and cultural, broadly speaking) that account for particular configurations of nature and culture, society and nature, landscape and place, as lived-in and deeply historical entities” (2008, p. 29). This *socionatural world* embraces the fluidity of the lived experience, experiences the multi-dimensional relations to a place or peoples and engages with historical and living perspectives. This is a life-affirming worldview that fits with the conception of Cosmic Awe because it necessarily invokes a reaction that is more than just rationalization.

Cosmic Awe is almost a point of intersection between Cosmic Revolution and Cosmic Hope, as it is the experience of the new or possible material conditions through action. Cosmic Awe is imbued with the *Not Yet*, which Bloch described as the presence of possibility (Bloch, 1996). In Hope, the expression of negative capability is essential for moving away from the hegemonic and towards the unknown. This movement is facilitated by cosmic awe. Negative capability helps to break Human/Man free from the dualism of Western thinking by granting space for multiplicity and doubt, yet it is not necessarily a retreat.

Smith considers that the shift must take the form of moving from “conquest of nature” to

“adaption to nature,” yet, without a critique of the expansion of capitalism into space, this shift cannot occur (2015). The conquest of nature is essential to capitalism. The exploitation of natural resource is a critical component of the economic system. Yet, Smith seems to think that emphasizing that human beings are adaptive to nature is only a matter of “reconsideration,” instead of an entire struggle against several systems of exploitation. To move towards an adaptive of nature, humanity must reject colonialism, capitalism, and patriarchy.

The notions of openness and fluidity may allow us to think through this adaption, as they foreground the necessity of leaving things undefined. There is something powerful, even mystical about the idea of the open, the unknown, and the Not Yet. The Killian formula and its limited possibilities explodes the unknown, not with openness, but through categorization and use-value. The Killian understanding of the universe reduces both the universe and humanity to What Has Been. This does not allow for radical difference nor change; it produces only technological changes with regressive, even stunted, developments of social, political, or cultural ways of being.

Of course, someone may object that, if this is true, then how come some theorists have imagined another world? Because the operations of colonialization and capitalism have always already produced multiple worlds—some oppressed and filled with death, some with technological advancements, glitter, and gold. Theory cannot make the future; only the world, the body, and the community can do that. This is why Cosmic Revolution is the final element in this consideration of the future. For me, there is no theory of the future, only possibilities of ways of walking. In the words of Gloria Anzaldúa, at some point we must leave the side of the river (1986). The future cannot react to the past, nor can it find its hope or purpose in the past. It cannot find those things in the present either. The future must remain the future: The Not Yet. Until now, space theorists, advocates, and the elites have looked back as much as forward, dragging with them the colonial and capitalist oppressions that made the frontier. Instead of reaching into the past to produce a future,

the future begins here, not because of what is or what should be; it begins here because it is where we (humanity, in all its various forms) are. What comes from the combination of Cosmic Hope, Awe and Revolution is still yet to be known. Perhaps the radical interconnectivity of a new cosmic order will flourish.

For many, the future belonged to God. According to some Russian Cosmists, we humans could become that God (Tsiolkovsky, 1934). Perhaps we do not need to become a new God, but, rather, a new human—whose possibility resides in us now—that must be nurtured and protected from the vile forms of the past and present. There is no future without the starving and filthy masses of this world. A universe in which many universes exist is the future, the only possible future is all the futures, and this is only possible once the cage of the Killian formula is torn apart, which cannot be done with the tools of oppressors. It has been necessary to diagnose the problem of coloniality within the various theories and visions of the future in space. The failure to diagnose the actual problem, the real reason and problem with the American space paradigm(s) and ideology has complicated the task of envisioning a future difficult.

There is no future without the liberation of humanity. There is no liberation of humanity without the decolonization of the idea of liberation or the idea of humanity. There is no decolonization with the master's tools. The only future is the future with futures, with peoples, with liberations vast and varied. All need to be decolonized, even the colonizers. This is why the idea of a universal and abstract liberation is impossible. We all require different forms of liberation. To universalize it merely emboldens the colonial matrix of power, rather than diminish it. To move forward, space exploration cannot be pursued as a reaction to contemporary political aspirations, nor can it have any motivation or justification that comes out of desperation or fear. The only way into and about space is through an unknown hope, Cosmic Hope—hope for and without intention.

It is about taking what comes as it comes, but that there must be movement and response. It is and must be a paradox of response and action.

No future is produced without a rigorous process of procreation and birthing. This is the engagement with *Nepantla*—the suffering and unknowability of the future that is essential for the production of a future in space without the conditions of coloniality. Intention of difference is not enough to produce a difference. Material conditions of governance, of social relations, of racial and sexual relations, and the very understanding and being of Humanit(ies) must be transformed to (eventually) produce a world (a universe) without coloniality. Or, at the very least, a world of worlds that rejects coloniality and struggles against it for a future of vast possibilities. To propose these changes, I will remap conceptions of change (the formula) on top of the aspects of cosmic orders that Krupp observed. This does not mean that space exploration must wait for the *revolution*, but that the process and intention of space exploration must be made into a revolutionary form. As Ben Finney wrote:

Yet, settling in space will be a revolutionary act, because leaving Earth to colonize new worlds will change humankind utterly and irreversibly. Anthropologists focus on technological revolutions and their social consequences. The original technological revolution, that of toolmaking, made us human. The agricultural revolution led to the development of villages, cities, and civilization. The industrial revolution and more recent developments have fostered the current global economy and society. Now, this same anthropological perspective tells us that the space revolution is inevitably leading humanity into an entirely new and uncharted social realm. (Finney, 1992)

Let me state, however, that the space revolution and space exploration as revolutionary are two different things. Space exploration as a revolutionary form requires more than just the requisite technological advancements. It also requires a theory of the human, of nature, of relationships and processes, which can be produced out of imagination and hope. As Gloria Anzaldúa writes:

But it is not enough to stand on the opposite riverbank, shouting questions, challenging patriarchal, white conventions. A counter stance locks one into a dual of oppressor and

oppressed: locked in mortal combat, like the cop and the criminal, both are reduced to the common denominator of violence. The counter stance refutes the dominant culture's views and beliefs, and, for this, it is proudly defiant. All reaction is limited by, and dependent on, what it is reacting against. Because the counter stance stems from a problem with authority—outer as well as inner—it's a step towards liberation from cultural domination. But it is not a way of life. At some point, on our way to a new consciousness, we will have to leave the opposite bank, the split between two mortal combatants somehow healed so that we are on both shores at once and, at once, see through serpent and eagle eyes. Or perhaps we will decide to disengage from the dominant culture, write it off altogether as a lost cause, and cross the border into a wholly new and separate territory. Or we might go another route. The possibilities are numerous once we decide to act and not react (1986, p.100-101).

This is where a paradox of action and reaction reside. It is different to react to a changing environment in relation to others and the world than it is to react out of desperation and violence. It is impossible to escape the violence of Modernity. It must be directly fought not only to counter death, but to embrace life. Thinking and dreaming are only forms of radical action because they are ways of finding *Las Rajaduras*. Hegemony is a rigid structure that requires the rigidity of all things and peoples. One's embodiment of fluidity finds the cracks in the structure of Modernity.

Cosmic Revolution

“The cosmos is a grand weaving in progress. *Nepantla* is therefore ordinary – not extraordinary. The ordinary is not interrupted by *Nepantla*; *Nepantla* is the ordinary” (Maffie, 2014, p. 363). Unlike Nixon's integration of the extraordinary into routine to boost the mythos of American Exceptionalism, engaging with the cosmos in a relational manner should be normal and accessible to all. *Nepantla* as ordinary does not diminish its important as a transformational site, but, rather, harmonizes the relation between humanity and the cosmos. To embrace Cosmic Revolution is to engage with *Nepantla*. There can be no fixed reason for going into space, nor can there be a rigid relationship to the stars. Cosmic Revolution is the radical acceptance of adaption to conditions and

changes that cultivates the potential for a diversity of relationships that evolve or are practiced in an open way within an interconnected universe. Encounters with peoples or places or ideas can be individual or communal, religious, or pragmatic. By removing the disposition for exploitation within the cosmic order, Human/Man is reoriented back into the fold of nature. The abstract Humanity is no longer the exploiter, but, rather, is made up of an infinite concatenation of peoples. The end of exploitation results in the reconceptualization of nature as interconnected and harmonious. This reconceptualization will take place not through the lens of Bacon who reduces Nature to the property of Man and his consumption, but, instead, through the life of humanity in its multitude that produces multiple forms of coexistence with, and within, the universe. Even this falls short of an expanded solar system of nature for relations. What I wish to emphasize is that an Earth-based cosmic order, or even multiple earth-based cosmic orders, will not fit a spacefaring civilization, nor will a space faring civilization ever succeed with a rigid cosmic order. Cosmic orders are often representative of the conditions of life in a specific culture. The experience of bodies and modes of being in space will be an active relationship that will require more fluid and intimate frames of reference. The experience of astronauts in space, especially the Overview Effect, leads me to theorize that a new cosmic order may reflect the material conditions of space itself. The Overview effect gives us a good indication of how living and experiencing in space may force a new, different psychological and sociological frame. Yet, because only politically hegemonic and economically driven programs have successfully sent people into space, structurally alternative forms of engaging with the world have not yet encountered the experience of space. The colonial-capitalist structures of the United States enforce and reinforce norms and forms of patriarchy and colonialist ways of being and knowing. Thus, it is that only Human/Man, even when not identifiable as, has gone into space.

When considering space migration as possibility for engaging with the transformative space of *Nepantla*, what must be noted is that, according to Philip R. Harris, space migration “may be the first time in human history that people consciously design the kind of Culture they wish to create in an alien environment slated for exploration and exploitation” (Harris, 1992, p. 191). Harris is attempting to embrace the creative aspect of space migration. After all, migrants will have to form their norms and relations. Yet, Harris assumes that human relations with and towards outer space are currently a blank slate. This reaffirms that Puritan relation to the New World as completely within their control. On the contrary, embracing *Nepantla* as part of the cosmos—forms of uncertainty and mass possibility are not temporary, but also existing—constitutes a paradoxical human existence of always adapting and being in motion. We must fight against the motions of the cosmos, but instead learn to move with them. As such, people will consciously make their culture in relation to the world around them. It will not be wholly human, but instead a socionatural world. I would like to theorize *Nepantla* as cosmic interconnectedness and motion is always present in the socionatural conditions around each celestial body. There must be time, consideration and experience of a space or place to reorient or create new relations with it and the people of the community. This produces a universe in which many worlds and many experiences of those worlds are possible.

This is consistent with how Mignolo describes possible “decolonial futures would involve, first, following up on the demands and needs being expressed around the world, rather than projecting Eurocentric demands and needs around the world” (Mignolo, 2011, p. 285). This is also similar to how Anzaldúa thought of “Living in *Nepantla*, the overlapping space between different perceptions and belief systems, you are aware of the changeability of racial, gender, sexual, and other categories rendering the conventional labelling obsolete” (2015, p. 119). It is moving through *Nepantla* that is essential to the migration into space.

Migration in this context is the movement of peoples to different places within the solar system or galaxy. If there are a multitude of epistemological and ontological forms, this will foster alternative paths. This begins by locating and peering through *Las Rajaduras*. It is through those cracks that the appearance of Modernity falls away and the rigidity of the colonial forms shatters to make space for numerous possibilities of action. In this case, action is not using space exploration as a reaction to the political, social, or cultural issues of the times. It is actively dismantling the cosmic order of coloniality by producing another cosmic order that is not a reaction against the conditions of coloniality and capitalism, but, rather, a wholly new and separate.

It is almost certain that humanity, in all its forms and beings, will go into space. Yet, it is uncertain what will motivate this migration: perhaps revolutionary consciousness, perhaps the questionable and Malthusian idea of survival. Perhaps the motivation for the peoples of Earth to leave this planet has not yet been formulated. Space exploration as a revolutionary act may begin in ways that are counterrevolutionary, but the conditions of space will promptly overcome toxic ways of being. Living and being in space will require a form of social order that does not embrace toxic masculinity or individualist approaches to political and ecological forms. As I mentioned in my third chapter, the Final Frontier will require the creation and maintenance of oppressive labour practices. For this chapter, however, the turn away from the capitalistic labour circuits will not be the reason for the expansion into space. Space, then, will be explored, as it has been, but the conditions that produced those expeditions will not be the conditions of the world in space.

“Rigidity means death” is an evergreen notion, tested and proven again and again. Democracy, theory, freedom do not exist in a healthy and meaningful form when static. We hear this idea expressed by Ernst Bloch: “Reality has no fixed size. The world is not finished” (1970, p. 52). This is the very starting principle for a new cosmic order. The world is not finished. I begin with

this condition for two reasons. First, the institutional, systemic, and individual ability to adapt to new, changing, or challenging situations, forms and worlds will be essential to even leaving the Earth. Second, it opens the world to the universe. The unfinishedness of the world is not a seeking for completion, as like *Nepantla*, it is an everlasting condition. The world must remain unfinished. For that is how we go on. It is to accept that the world, even the whole of the universe, is incomplete and move towards completion anyway. Bloch continues, “Reality is a category which is exposed to flexibility and which is obligated to change” (1970, p. 53). The reification and ossification of the world is a condition of capitalism (Haraway, 2000). Yet, space exploration presents a unique opportunity of movement. And, if my work until now has been a critique of the limits of a space exploration born of coloniality, how can *mere hope* change anything? Hope is one of the most obvious aspects of space exploration—hope as action, with the Not Yet, produces an orientation of action that continues in spite of the troubles and oppressions. As Mignolo and Walsh say, coloniality may never be completely gone (2018). That doesn’t mean we stop—another world, the open world, the world of many worlds, the world that is not finished only happens when we continue to create—taking advantage of the cracks in coloniality, when the flower blooms that cracks the cement. The flower does not wait for the roots to grow first, it is only through the blooming that the sun is reached, and the strength of creation destroys what once was. The world that is not finished is the flower blooming, for that flower may die—but its death is the fruit and fertilizer for the next flower, for the young bee, for the eyes of the new artist. In explaining Bloch’s Not Yet, de Sousa Santos states, “The Not Yet is the way in which the future is inscribed in the present” (2014, p. 183). It is that which is that has the possibilities of the future within. It is not “neutral,” says de Sousa Santos, as “the Not Yet inscribes in the present a possibility that is uncertain but never neutral; it could be the possibility of utopia or salvation or the possibility of catastrophe or damnation” (p. 183). And from this, space exploration holds the Not Yet. Although the future in space can reproduce the

conditions of coloniality, it holds the possibility of salvation—not the neoliberal Puritan salvation—of a world in which many worlds can exist. As Eve Wiederhold interprets Anzaldúa, the borderlands are where we “can open ourselves up to the energy of creativity while facing the abyss of the unknown in our attempts to manage it” (2005, p. 120).” If, as de Sousa Santos writes, “Possibility is the world’s engine, \” then space exploration can be that process that produces it. It is not out of lack that space could be explored—the lack of natural resources, the lack of a safe home (an unpolluted home planet) —but the search for *El Mundo Zurdo*, which Gloria Anzaldúa’s “visionary place where people from diverse backgrounds with diverse needs and concerns coexist and work together to bring about revolutionary change” (2005, p. 9). Or, in Anzaldúa’s words directly, “The pull between what is and what should be. Believe that by changing ourselves we change the world, that traveling *El Mundo Zurdo* path is the path of a two-way movement – a going deep into the self and an expanding-out into the world, a simultaneous recreation of the self and a reconstruction of society” (2005, p. 183).” Obviously, Anzaldúa is speaking of a living experience of people of color, mostly women, yet, if the *El Mundo Zurdo* is used as a model for transformative cultural and social organization, especially during the early years of space migration, it can enable the intentional opening-up of cultural and social space for the unknown, for the social abyss that contains the Not Yet, even though that Not Yet can hold horror or utopia. Although Anzaldúa was seeking a more revolutionary multiculturalism, I think that what *El Mundo Zurdo* represents for the adaptive yet life-affirming aspect for space expansion is an understanding *and need for* the unknown, and the creation of something new, based on material conditions that exist in space that will be experienced by those who inhabit them.

How might we experience the worlds, lives, features, and creatures that live with us in this universe? What will some new and currently unknowable cosmic order look like in some future in space? This question cannot yet be answered. That is the very point I have strived to make. We do

not yet know the expansive and diverse material conditions of the futures in space, but we can sense that all relations must be cultivated mindfully and with an almost paradoxical framing: the constant attempt at striving to move, map, adapt and experience all the universe with humanity in mind, while at the same time accepting the inevitable need to redefine and re-examine the very nature and conception of humanity. In short, the acceptance of what comes without losing the earthly soul of community. Hope is that strange idea that compels us forward, even in the darkest of hours. It is both an idea and an emotion. And perhaps that is what we need—those ideas that are emotional and material—emotions that are actions and reflections and material conditions that are human and inhuman. We must know the river we cannot cross; to never return to an exclusionary form of the Man/Human, and to not know the future of humanity, of nature, of the universe and our place within it. That is why I choose migration to describe the movement into or out of space as it does not consume or exploit that which it encounters. The encounter part of this new formula is not some utopian idea, bound to exist only in the minds of men, but rejects utopia as the Zapatistas do (Khasnabish, 2008), As Alex Khasnabish writes:

Rather than despairing at the decline of the dream of utopia, we need to collectively recognize—and seek to reclaim—the space and capacities of radical imagination and hope their passing has left room to explore. How can we understand radical invocations of imagination and hope in a political context that is effectively post-utopian? Does an explicit theoretical and practical consideration of concepts such as imagination and hope allow for new and significant conceptualizations of political spaces and practices? (158)

Khasnabish does, and I agree. What migration into space, and within space, does is produce a conscious rupture? Norms do not follow because they do not fit. And when this occurs repeatedly, new forms of the social and the political, as well as cultural and ideological, are bound to emerge. This is not a fake or forced emergence. These forms can resist the hegemonic relations of coloniality only when internal relations are not bound to power but to change.

It is by leaving the imagination open, with a culturally and social fluid form, which encounters with new worlds, possibly intelligent entities and ways of being can be embraced within a cosmic ordering that is not colonial or capitalistic in nature. As Ben Finney writes, “Space development scenarios are inherently part of larger scenarios of human development” (1992, p. 37) which means that, by migrating to and encountering space and its context, human beings can change themselves. If the analysis in the preceding chapters revealed the issues of the final frontier as the American cosmic order, then this chapter to attempt to address how to overcome them. In the same way that any crisis is an opportunity, this venture into space is an opportunity to avert a future crisis.

World of Worlds

With awe and wonder you look around, recognizing the preciousness of the earth, the sanctity of every human being on the planet, the ultimate unity and interdependence of all beings—*somos todos un país*; Love swells in your chest and shoots out of your heart chakra, linking you to everyone/everything.... You share a category of identity wider than any social position or racial label. This *conocimiento* motivates you to work actively to see that no harm comes to people, animals, ocean—to take up spiritual activism and the work of healing” (1986, p. 77)

We again return to Gloria Anzaldúa, for it is in her we find that motivation that Arthur C. Clarke mentions, the drive found in von Braun and the very essence of the Russian cosmonauts. This calling, this immutable draw, is the very thing that can be the base for the revolutionary change needed to produce a world in which many worlds are possible. Can earthly dreams produce cosmic results? I believe so, but only in a limited way. After all, the world in which we live is so vastly different from the world in which homo sapiens evolved. In *the Frontera/Borderlands*, Anzaldúa offers us a unique opportunity to accept that wounds bleed, that those wounds are many and different, but we can have the last say, and that say is another way. We build and change our environments. We produce and work, as, according to Marx, this is what makes us human (2013). Yet, as this chapter strives to explain, the rigidity of these conceptions leads to death. The cosmos and the cosmic

order(s) that may someday exist will need various amounts of fluidity and hope to thrive in a new world. This is not the fluidity of the American cosmic order in which frontier rhetoric stayed the same, but space goals were linked to the political and economic climate of their times. In reality, this appearance of fluidity rigidly complied to the logic of coloniality. This is why the Final Frontier could remain the central theme of the space age *because it revealed the actual rigidity of the cosmic order*. The proposal I have offered in this chapter is not meant to be comprehensive or all-inclusive, as it cannot be. What I hope to offer here is the idea that for space exploration to truly be a revolutionary force, the first moments and movements in space (as a spacefaring world) need to be understood for their impact on future generations. The future can still be something bright and hopeful, the Not Yet need not descend into darkness eternal. After all, as Marx says, the highest form of communism will have the social form of “From each according to his ability, to each according to his needs” (1943, p. 566) This social form need not be that of communism in the twentieth-century sense, as this would again exclude many indigenous peoples from this new relationship with the world. And so, the classic Marxist conception of communism cannot remain rigid without some form of decolonial critique.

Zapatistas Subcomandante Insurgente Marcos writes that the old gods “looked and realized that every bit of that dawn was speaking truths and that one person alone could not listen to all the nooks and crannies of it, so they divided up the job of listening to the dawn. ...And that is how the very first gods saw what was needed for learning, and working, and living and loving. ...They saw that all are needed to make the world turn” (2001, p. 96). A multitude of possibilities. *Un mundo donde quepan muchos mundos*. If the Human/Man is the personification of the Human that ventures into the Cosmos, the potential of humankind is rendered exploitative. This is not the essence of the human; it is not the core of the human experience. To be human is not to be rational, as Kant assumes. To be human is to experience Cosmic Awe. The stars and the Moon are that thing that all experience

and cannot claim. The sky, both day and night, is ours to connect with, not keep. The Sun is the guide towards life; the Moon is the guide towards the spirit and death. This is not an experience of rationality. This connection is the closest that the West gets to a completely ecological frame. And God said let there be light, and He saw that this was Good, and Man saw that He was God. And since then, the sons of Adam have sought to be God, to feel like God. But control of the world is not godlike—it is death. The children of the earth can seek a true connection to the cosmos, not through control, but through surrender. Western Human/Man has nothing to lose but his chains. We all hear the cosmos calling. So, let us listen without mediation.

Conclusion

Space exploration has the potential to change the world. In many ways, it has already done so. But this has been unevenly distributed insofar as emphasis is placed on benefits rather than common heritage. The three principles set forth in this chapter are both concrete and abstract. The concrete expression of these principles will vary, from direct engagement with the colonial forces within the space community, to embracing the irrational awe of the cosmos as an individual or community, and to militant-protest against the continued capitalization of space exploration. Each of the principles propose a different relationship to the cosmos, not based on the exploitation of it, but based on the engagement with it in some practical way. Cosmic Hope is the acceptance and action of unknown; it is movement towards humans and nature through the letting-go of certainty. Cosmic Awe is the experience of the cosmos as more than human, more than nature. It is the embodied emotional and aesthetic experience that resists rationalization. And Cosmic Revolution, the working towards an interconnected, non-hierarchical world by adapting to, and working towards both the material conditions of the worlds and the possibilities of being human. Outer Space offers humanity directly engagement with otherworldly *Nepantla*. Currently, outer space is not acceptable

except through the nation-state and private industry. Coloniality and capitalism hold tight the engagement with, and access to space. In this way, only the Human/Man has direct access to outer space only through and with the tools of master. But, as the Overview Effect shows, the experience of space is beyond the control of coloniality. Cosmic Revolution is action taken on Earth with the intention of creating and sustaining possibilities for all on earth and in space. It is the reconfiguration of the Killian formula from exploitation to encounter, from control to harmony, and from exploration with intent of exploitation, to exploration with the intent of life. As Anzaldúa writes:

Nepantleras acknowledge an unmapped common ground: the humanity of the other. We are the other, the other is *us* the concept AnaLouise Keating calls “re(con)ceiving the other. Honoring people’s otherness, las nepantleras advocate a “*nos / otras*” *positionas asler*. other. than “us” and “others.” In *nos / otras*, the “us” is divided in two, the slash in, The middle representing the bridge—the best mutuality we can hope for at the moment. Las *nepantleras* envision a time when the bridge will no longer be needed but will have shift to a seamless *nosotras*. This move requires a different way of thinking and relating to others; it requires that we act on our interconnectivity, a mode of connecting similar to hypertexts’ multiple links—it includes diverse others and does not depend on traditional categories or sameness (2015, p. 151).

For Anzaldúa, the *Nepantleras* are the peoples that bridge the worlds, the peoples, but they look beyond. To look beyond mere connection to interconnectivity requires the multiplicity of epistemologies and ontologies. It is to reject the totalizing epistemology of the Final Frontier. The Final Frontier is a rigid connection to the past that embraces systems of oppression because they can be used by individuals for gain. Cosmic Revolution is a fluid interconnection with all things in and of the cosmos. Yet, it is a rejection of the death march of Modernity/Coloniality. The social and cultural norms of space communities should value interconnectedness, “collaboration and cooperation rather than excessive individual and competition” (Harris, 1992, p. 199). This is more than just interconnectedness with other peoples, but with the material worlds, the living-beings and

the non-sentient beings across the universe. It is neither a going back to “before Modernity/Coloniality” or is it a utopian fantasy of life after coloniality. Cosmic Revolution is the willingness to direct engage with possibilities, to hold that undervalued ways of being and thinking can be expressed without violence, and to hold Hope and Awe within ourselves and our systems. This is only possible through critical examination of hegemonic constructions. In this way, Hope becomes practice by seeing another world through *Las Rajaduras*.

Chapter 6: As Above, So Below

"History doesn't repeat itself, but it often rhymes." -Mark Twain

"As long as I fight, I am moved by Hope; and if I fight with Hope, then I can wait." -Paulo Freire

There is Nothing New Under the Sun

The May 6, 2019 issue of *The New Yorker* featured an article written by Rivka Calchen entitled "The Eighth Continent: The New Race to the Moon, for Science, Profit, and Pride," which describes the plans and projects of public and private entities for the Moon. According to Calchen, the Moon is "hot" again. What is notable about the piece is not the seemingly religious fervor of the people who work in the space industry, nor her descriptions of the various projects. What is so obvious to me is how much of this I have heard before. The art that accompanies the piece depicts astronauts in high-tech western wagon in an Oregon trail like caravan. Since the start of my research, I have read hundreds of articles, if not more, about this very idea: "Space is hot." "The Moon is hot," said the 1960s. "Space colonies are hot," said the 1970s. "American space is hot," cried the 1980s (Brand, 1977; Brown, 1978; Gibbs-Smith, 1974; "THE NEXT FRONTIER - SPACE: 1," 1984; "Space Programs Aren't for the Faint of Heart. (Editorial Desk)," 1989; "Venus May Tell Us How to Escape Its Fate; The Next Giant Step," 1989). Each era shared the same dream and offered the same justifications for exploitation, exploration, and control. These repetitive narratives comprise what I consider to be the Final Frontier, the cogitative, imaginative, and theoretical trap in which coloniality and capital have ensnared the space community. The Final Frontier is the space superstructure of the colonial and capitalist base. The Final Frontier is the cosmic order of coloniality. As detailed in earlier sections of this work, the cosmic order in the interconnected

relationship between a society and its relationship to the cosmos as well as how the cosmovision impacts that society. Often, the ordering of that society is justified by the way in which the cosmos is believed to operate. Currently, we cannot perceive the limitation and entrapment of the imagination; the Final Frontier renders the whole universe in terms of exploitation. It is the endless frontier where the West can re-enact its genocides and epistemicides again and again. The Human/Man can conquer Mars just as he conquered Mississippi. The Human/Man can reconstruct land purchases on the Lunar surface as he once did with Louisiana.

This repetitiveness of space exploration, from the frontiers to the constant talk about limitless solar power, denote a trap. Science can speak of the sun, but any discussion of the social dimension of space becomes economic as the language we use to refer to it is shaped by the cultural and social impact of capitalism in the West. If science represents exploration, then this exploration is bound to lead to exploitation. This is not how ancient cosmic orders understood their worlds, and it is not the only way that the peoples of earth can relate to the cosmos. Yet currently, it is the only way that the West relates to it. Why can we not think beyond? What has become obvious is the hegemonic American cosmic relationship that developed during the Space Age falls under the domain of the Killian formula. The first expression of this policy was strikingly direct. The government's intention for outer space was the exploitation of it. What initially started as political exploitation, linked to the ideology of capitalism, has become capitalist exploitation with the backing of the US government. Not only does the Killian formula reveal was the United States' government's relation to outer space, but also how the West relates to all things outside itself. While never again was the Killian formula expressed so directly, it manifested itself time and time again in policy and discourse.

When stated plainly, it is obvious that the American Cosmic order is one of coloniality. The imagined relationship—cultivated by technological engagement with space and all its bodies—reflects the history and value system of the United States. Cosmic Orders historically legitimize governance through religious association, deify leaders, and sustain the value systems and visions of the world (Krupp, 1997; Tarnas, 2006). The Final Frontier, the American Cosmic Order, contains these elements. From the Puritan calling to Salvation to the United States’ mission to contain communism, the American cosmic order is deeply religious (even in its secular forms). There is the celestial reverence for leaders in the President’s responsibility to direct space policy. Furthermore, there is the status of near-sainthood that President Kennedy has been granted by the space community due to his involvement with the Apollo program. The value systems of Final Frontier are those that Turner associated with the Frontier: individualism, hard work, and democracy (1960). This is only the surface of the values that are absorbed into the American cosmic order. Only through the integration of Turner’s values does coloniality begin to disclose its presence within the abstract language of universals. When the United States claims the universal mission of leading humanity into space, one must ask: who are these humans? The Final Frontier produces a vision of the world that is nothing other than a future of unlimited capitalism and denial of those on the other side of the abyssal line. What space advocates have dismissed—as “there are no Indians in space”—is the colonial logic of the American venture into space. This idea appears repeatedly in advocacy, even in *The Whole Earth Catalog’s* special issue on space colonies (Brand, 1977). Politicians used the frontier metaphor for its emotional impact, as exemplified in President Reagan’s *Challenger* speech of 1986. As he lamented the loss of the *Challenger* crew (new pioneers), Reagan linked the old west to the exploration of space, as so many had done before. Yet Reagan affirmed the Frontier metaphor in a way that had not been done since von Braun. Reagan used the Frontier to define and reaffirm the American pursuit of space (1986). Thus Reagan, like von Braun, saw outer space was

the wild west, because breaking through the Frontier is America's predestined task. For Turner and Webb, the Frontier produced the exceptional nature of the United States, which, of course, is related to the Puritans' belief that America was God's promised land, and that the wilderness of the Americas was equivalent to the Biblical wilderness (1992, p 22). I would agree that there is something about the Frontier that foregrounded the American nation, but I would not associate it with the aspirational and egalitarian aspects of American culture. The underlying prophetic narrative of the Salvation of the World, of America, comes at the price of justice, of equity, of freedom and dignity. Regardless of what presidents, policy makers, and space advocates say, the west cultivated the bloodthirsty, racist, and genocidal political and social structures that have and continue to impact the peoples of America and the world. The Cosmic Order of the United States is the Final Frontier because this vision of the future assumes and assures that the hegemonic cultural, social and political forms will reverberate through the stars. Under capital, celestial bodies are for the consumption of Human/Man. The universe is not a nature of which we are a part, but, rather, a resource for exploitation. There is no way to relate to environments, places, or peoples without the mediations of the capitalist totality.

The famed excuse — “there no Indians in outer space” — may seem to justify exploitation and appear repentant of historical sins, yet it is uttered in ignorance of coloniality. If the full logic of coloniality were extended into space, then there is only one way to actively acquire and exploit it: the control and abuse of labour. While the darker side of western modernity remains in the shadow of space exploration, neither the expansion into space nor the radical transformation of the relationship with outer space is possible without struggling against the logics of coloniality. By failing to interrogate the Final Frontier, the Western cosmic view of the heavens as hierarchal will continue unquestioned. It is integral that the logic of the US political and social position is decolonized for alternatives in space to bloom. Space elites and advocates have focused on the scientific and

engineering spaces of space exploration too often without questioning why they lean on the Frontier as a social, cultural, and political model. The boom-and-bust cycles of space commercialism, the lack of infrastructure needed for expansion and the lack of return value spring from this failure to shift the focus. This use of the Frontier metaphor—without an actual understanding of what it is or how it emerged—produces such unrealistic ideas about both past and the future. Neither can it function as a map or a warning when the Final Frontier is assumed to be eternal. Given that coloniality has entrapped the imagination and reduced all epistemologies to only that of the West, it is understandable why space advocates would engage with the Frontier as a way of advancing space exploration, but it does not lead to a future that for the benefit of humankind.

Cosmic Interior

As I mentioned in the introduction to this chapter, the repetition of space rhetoric is more than journalists not researching older articles or scientists trying to rebrand a similar idea of life on Earth to gain support for space exploration. This repetition reveals a stagnation of culture and imagination towards space exploration. Despite the vastness of outer space, with the galaxies, stars, and planets, the popular press and advocates alike continue to regurgitate the same ideas and hegemonic notions of life as a vision of the future. Is it any wonder that advocates have lamented the dwindling popularity of space exploration since Apollo? Can futurists and thinkers really not move beyond tired Western metaphors and promises of solar-powered satellites? Western space exploration is trapped in the colonial matrix of power to its own disadvantage.

This repetition may come from one of another related fixture of space exploration: the connection to utopian communities. The utopianism of space exploration posits the desire to solve current problems and fulfil current needs as central to its existence, but this has also become a trap. Space exploration cannot be expected to solve the problems of the contemporary political or social

conjunction without first deconstructing the systems that produce those problems. Space exploration and the colonization of space cannot solve the “problem of poverty,” as only a transformation in the systems of production, distribution, and allocation can accomplish this. This is a direct result of the lack of epistemological diversity that reduces the possibilities of imagining a beyond, because so few ways of thinking are validated or valorized.

I have aimed to demonstrate in this work that the underlying conditions of coloniality and capitalism foster a social, cultural, and political climate that creates restrictive conceptions of the future and limit the possibilities of future life. The popular use of the Frontier metaphor in space exploration policy and advocacy is the colonial imagery that signifies that the logic of coloniality still resides within the conception of space exploration. The Frontier metaphor has been used by numerous people, in a variety of ways, to boost nationalism, individualism, the glorification of the West, and the rationalization of economic expansion into space (Abbott, 2015; Bainbridge, 2009b; deGrasse, 2005; Neal, 1994; O'Neill, 1977; Von Braun, 1952; Zubrin, 2002) All of these use, however, can be reduced to exploitation. This is not a simple notion of intention or inclusion, but, rather, the movement of multilayered structures that bind the modes of production, coloniality of being and the cosmic orders of the Western world. It is formed of all the things that have produced and co-produced, mirrored, and reinforced Modernity/Coloniality. Although this is not a work about technology, it does reveal, as Marx stated, the active relation between man and nature—a relation of exploitation under coloniality and further exploitation under the conditions of modernity (2013) .

The repetitiveness of space rhetoric stems from the conditions of Modernity/Coloniality, as that coloniality shapes the political and social forms that continue to influence peoples, institutions, and ways of thinking even after the end of formal colonial administrations. (Grosfoguel, 2002).

Coloniality is central to the American Cosmic Order, as coloniality forces nature and culture to be understood and experienced as separate domains. Modernity/Coloniality enforces this division because it reinforces Human/Man's dominion over nature. Yet, this is not the only way to relation to or be with nature. As Walter Mignolo states:

Aymaras and Quechuas saw themselves in (nature), not separated from it. As such, culture was nature and nature was (and is) culture. Thus, the initial moment of the colonial revolution was to implant the Western conception of nature and to rule out the Aymara and Quechua concept of Pachamama (Mother Earth). This was basically how colonialism was introduced into the domain of knowledge and subjectivity (2011, p. 11)."

By displacing a human/nature interconnectivity with a hierarchal relation of exploitation and enforcing this conception through violence, the West was able to restructure knowledge and subjectivity. The Pachamama conception of the human/nature relation differs completely from the Western tradition, and this interconnectedness of culture and nature does not allow the extravagant exploitation of the world. One of the most significant aspect of cosmic orders were the ways in which that culture's cosmo-view situated it within the larger universal context. The cultural ritual, or governance and symbolic association, does not attempt to outrank or overthrow the cosmos, but, rather, finds significance in becoming part of it. There is often an aspect of hierarchy associated with any given culture's cosmic order that places itself at the Center of the World. Yet, the centering of a culture and the west's claim to all nature as resource are fundamentally different. The Western relation to nature as it corresponds to the economy is explained by Mignolo:

Sir Francis Bacon published his *Novum Organum* (1620), in which he proposed a reorganization of knowledge and clearly stated that "nature" was "there" to be dominated by Man. During this period, before the Industrial Revolution, Western Christians asserted their control over knowledge about nature disqualifying all co-existing and equally valid concepts of knowledge and ignoring concepts that that contradicted their own understanding of nature. At the time, they engaged in an economy of brutal resource extraction (gold and silver and other metals) for a new type of global market (2011, p.11).

This relationship focuses on extractivism for a global market rather than co-existing with nature in a sustainable way. It is this orientation that has reshaped the whole world since 1492. The Colonial Matrix of Power structures and influences conceptions of authority, which, under modernity, is the nation-state; of knowledge and subjectivity, through the Westernized university system; sex, race and gender; through racial hierarchies reinforced through labor practices, the reduction of gender to a duality, these characteristics, of marginalized people place them on the other side of the abyssal line; and finally, the control of nature through disregard and mass appropriation.

The archaeo-astronomical study of cosmic orders helps us to understand how worldviews function, and how social and political status is reflected back at a culture through their astronomical meaning-making. Across the world, from the earliest known records of culture, astronomy has been a constant aspect of culture-making (Krupp, 1983, 1997, 2015). Historically, cosmic orders were constructed through observation and symbols, but with the advancement of technoscience, access to the cosmos became possible. The common aspects of cosmic orders include a reverence for the fertility of the earth; social and political power coming from the sky; a culture understanding itself to be part of the nature order, often at the center; and celestial divinity for empire-building (Dickens, 2007; Grosfoguel, 2002; Krupp, 1983, 1997, 2015; McCurdy, 1997; Ossio, 1997; Rappengluck, 2016). Most notably, the cosmic order regulated and normalized what it meant to be human to that culture (Wynter, 2003). Through the construction of Earth as mother and Sky as power, there was a harmonious balance expressed many cultures' desire not to use too much of the earth nor ask too much of the sky (Krupp, 1983; Steele, 2015). This is not to say that all ancient cultures were harmonious with nature, but rather to suggest that the possibilities of such a relationship existed. Under Modernity/Coloniality, there is only one accepted relation, instead of the many that there were or could be.

In the second chapter, I detailed the influences on the development of the American cosmic order. It began with the Puritans' worldview of the New World, where all things were understood in relation to the plan of the divine, and moved to the secularization of these practices, while clinging onto a sense of exceptionalism and a narrative of salvation, which produced an idea of America as predestined to be the leader of men and the greatest of nations. This national American identity furthers the nation-state to claim all the land between the two oceans, because the indigenous peoples of the continent and their ways had long since been considered primitive. The conquest of the American west led historian Frederick Jackson Turner to declare that the Frontier is the defining aspect of American culture. As such, Western civilization itself—due to the perceived mission of America—was in the hands of the United States. Over the course of the twentieth century, this was affirmed and reaffirmed, not because of destiny, but because of the United States and the other western nations' mass appropriation of wealth from the land and the labour of these nations deemed to be extractable.

The impact of the Puritan culture and value system on the development of the United States cannot be understated. Within the development of the socio-political- economic forms of the US space program, a reoccurring element of the early Space Age was the idea of salvation/ survival/ The narrative of salvation that permeates space exploration stems from this core aspect of Puritan culture and its relationship to the United States (Bellah, 1992). What was once the spiritual focus of salvation of the soul secularized into survival through the “glories” of capitalism. We see this rhetoric reappear in the Newspace era.

Chapter Two set the stage for fully understanding why space advocates, past and present, use the Frontier metaphor in their attempts to attract support—political and public—for space exploration enterprises or government activities. In turn, chapter Three focused on the Final Frontier and how space advocates use this metaphor. The Final Frontier—the conceptual matrix

that encompasses the CMP—draws on the Puritan narratives of Americanism, the structure of the cosmic order and celebratory relationship of the United States towards the Frontier. In this way, “a thing’s name indicates the nature of its power, and since a thing’s power constitutes its essence, its name reveals its essence” (Maffie, 2014, p. 440). The essence of the Final Frontier is the totalizing power and genocidal orientation of American hegemony on Earth and in space.

This essence appears repeatedly in the works of space advocates and their visions of the future in space. Sometimes, this is expressed when the advocates rationalize eugenics for a “better” future on Mars (Szocik et al., 2018), or manifests in the salvation of the species through taking capitalism into space to guarantee unlimited resources (Barker, 2015; Shaghaghi & Antonakopoulos, 2012; Zubrin; & Wagner, 1996), or the expansion of the American way of life into space where the stereotypical white American family can live happily with only the benefits of space and capitalism as the basis of the governmental structure (O’Neill, 1977).

What each of these visions reinforce is the idea that Human/Man is an exploiter, and that space is nature only in the form of resources. The Human/Man should be changed to fit the environment of the colony so as to be productive for the economy (Schuster & Peck, 2016; Szocik et al., 2018). Such a reduction in the conception of Human/Man is not only inevitable, but could produce a new biological hierarchy, much in the same way that race was constructed through the development of capitalism. Szocik et al.’s speculative proposal for forced sterilization on Mars is not as outlandish or unusual as it seems. This is a reproduction of an accepted norm: that of the ability of the body and that disregard for the personhood of the person carrying the child. It eternalizes capitalism—that all bodies should be able to withstand the conditions of capital—the colonization of space to a capitalist venture that shapes even basic human experience.

This is a reinforcement of the very idea that the Western construction of the scientific method lacks bias, as biological science will solve the “problem” of the body in space, without questioning the economic foundations of epistemological condition, which, in turn, reveals the continued normalization of the conditions of war in modernity. The methodical evaluation of a human to determine their usefulness at or even before birth should be considered abhorrent, and yet this proposal has been published in a peer-reviewed journal. What are the visions of the future in space if they are reduced to mere relations of exploitation for the benefit of a few? The vastness of possibilities in the universe should not be reduced only to those of coloniality and capitalism. These visions all reinforce some hegemonic aspect of modernity. From O’Neill’s space suburbia and Zubrin’s call to save the West on Mars to Elon Musk’s attempt at a capitalist salvation, each vision carries a kernel of possibility. Yet, each of these visions also carry the conditions of coloniality. These visions reveal the paradigm of war that Maldonado-Torres sees as intrinsic to modernity. Each of these visions reinforce some aspect of coloniality: the normative social and cultural relations of the white middle-class; the celebration of western civilization as the beacon of progress reinforces white supremacy, and the transformation of religious salvation narratives into the survival of the Human/Man through capitalism.

Beyond advocacy is space policy: national and international directives that define and regulate nation-states activities of space exploration. On a national level, the president of the United States directs space policy with the counsel of advisors from all levels of society (Sadeh, 2002a). Due to the formally democratic nature of the United State, the President is accountable to the Congress and the general public (Sadeh, 2002a). American space policy contains the same elements of coloniality that exist within advocacy. The use of the Frontier metaphor is common in space policy, but it also takes more than just colonial imagery to fosters the colonial connection. The Killian formula displays the essence of the coloniality of space exploration in its direct consideration that

the exploitation of outer space is founded upon first its exploration and followed by the control of it (Johnston, 1958). This is the Space Age construction of Dussel's "I think/I conquer" mode of being. It incorporates all the necessary domains of the CMP by using knowledge (science) to understand better how to exploit a place, and accounts for the necessity of control to ensure a monopoly on exploitation. This developed during the Cold War as space was exploited for political gain before technology advanced enough for space to become essential for communications. The orientation towards exploitation continued as the US government began to encourage private companies to consider space for commercial use (Vedda, 2002).

The effects of coloniality on space policy do not only exist in the United States. The impact of the Final Frontier can be detected in the United States Outer Space Treaty and the reaction to the Moon Agreement. The OST and the Moon agreement both use the language of peaceful purposes and benefits of all mankind. By the continuation of the abstract universal in international documents, the systems of exploitation are legitimated on an international scale. The Moon Agreement's lack of acceptance may be due to the economic changes that were happening in the global economy at the time of ratification. By the late 1970s, neoliberalism was starting to impact the Western world (B. Young, 2011).

Policy and treaties are not the only non-advocacy aspect to consider. While Wernher von Braun could be considered a space advocate, his vision for space exploration can be seen clearly in the US trajectory of space policy. According to Dr. Day, the von Braun paradigm is a long-term vision of the migration into the solar system (Day, 1996). This bold vision sought to leave earth in stages until humans had occupied the entire solar system. Such a vision was deeply influential so much so that von Braun was able to popularize it through television and print media. Von Braun embraced the Frontier metaphor and the abstract language of humans, peace, and benefits. While

Killian prepared plans for exploitation, von Braun designed plans for exploration. However, due to the economic system of the United States and the Western world, the exploration of the von Braun paradigm was compelled to result in exploitation. This is how coloniality can continue to shape and constrain space exploration, regardless of the intentions of those who worked towards the goal of human life in space.

Furthermore, I examined the American public's thoughts on the justifications for the exploration of space. These thoughts map onto coloniality as economic rationales, nationalism, and more idealistic goals are mentioned in Bainbridge's surveys that he conducted from the 1970s through the 1980s. Unlike advocacy, where space exploration is the goal, or the government, where political standing and civic use of funds are the goals, public opinion can be influenced by a number of factors, including science fiction or faith. Cosmic destiny and wonder were both mentioned as valid justifications for space exploration (Bainbridge, 2009a). Yet, these also follow the logic of coloniality. The emphasis of all these justifications were the use of space for consumption. While this may reflect the utilitarian slant of American public opinion, it cannot be fully divorced from the workings of Modernity/Coloniality. What this reveals is not that there are not many ways of knowing or relating to the cosmos, but, rather, that only the hegemonic western relation—as a relation of exploitation—is allowed articulation or expression. All other ways of relating to space must be expressed or understood through this economic and exploitative lens. Consequently, space exploration is tied to the conditions of capitalism founded on colonialism. The inherent violence of Modernity/Coloniality is expressed as normal, poverty, war, militancy, and what it means to be a good human. All these elements are part of the cosmic order of coloniality and aspects of the Final Frontier.

There is a way to move beyond the colonial imagery of the Frontier and overcome a limited and limiting definition of the human. My critiques of the coloniality of space are an attempt to reveal what does not work. Space is not only exploitation. Human/Man is not the only human. There are *las Rajaduras*, cracks in the appearance of modernity. These cracks are the way to another world, one where many worlds are possible, as the Zapatistas would say. It is fundamental to examine what is not working. In the case of the Final Frontier, it is a cosmic order that reinforces hierarchy and exploits all things to the point of death. Who has benefited from this cosmic order? Certainly, the Human/Man, but not all of humanity. Cosmic Hope is the active participation in seeking a new world, while not returning to the old world out of fear. While Cosmic Awe functions as an embodied sensory experience of possibility, Cosmic Revolution is the material realities of outer space that require our adaptations. Taken together, they ready the human for *Nepantla*, the eternal transitional time-space that disorients and reorients those who engage with it. The possibilities for new, old, and different epistemologies and ontologies exists within these principles. They are ways of knowing and being that are radically interconnected in ways that go beyond the Western world.

What we risk by not addressing the colonial logic of space exploration in the American hegemonic context is a limited conception of humanity that does not include most of the world's population that allows the exploitation of a vast majority. After all, this is the current formation and foundation of the world-system. As de Sousa Santos states, "Modern western thinking is abyssal thinking. It consists of a system of visible and invisible distinctions, the invisible ones being the foundation of the visible ones (118)."

I call for a relation with the cosmos that exploits no one: not the humans who mine for the materials needs to build the rockets to go to space, not the partners or children of those whose labour produces the future, not the animals and eco-systems which exist, nor the cosmos and all that

it contains. I am calling for a shift from a cosmic order of coloniality to one of absolute liberation. The liberation of the oppressed and the oppressor, of the world and the other worlds, is only possible through the active, even aggressive, rejection of the conditions of coloniality and the production of a world in which many worlds are possible.

The Earth Opens

The very foundation of this work is that the concept of coloniality, the pervasive logic of colonialism and capitalism, is a constitutive aspect of modernity. This is an analysis of how coloniality is a constitutive part of the American cosmic order that allows normalized violence to be part of space exploration and impacts the visions of the future in space. By finding *las Rajaduras* in the Final Frontier, the exploitative aspects of the American cosmic order are made visible, if not obvious. The continued use of the Frontier metaphor in space policy, advocacy and communications is an act of concealment as much as it is an act of connection. It is the reification of the colonial matrix of power and its influence on the cosmic order. To reveal this, it was necessary to explain the foundational elements—cosmic orders and Modernity/Coloniality—and how they impact the conception (both self and other) of nature and humanity. Within the logic of coloniality, not all peoples are Human/Man, which reduces some peoples—mostly along racial lines—to nothing more than living labour.

The most perplexing issue of this research is the question of nature and the western reduction of nature to resources. What is even more perplexing is the lack of conceptualizing outer space as nature. As it has been directly produced as resource, it produces a conception of the universe as resource that causes the relationship of Human/Man to the cosmos to be mediated through capitalism. This mediation affects both (all) parties. In this case, the universe itself and peoples of earth are transformed into components of the system of capitalism. There is only one

way to encounter the physical universe: the medium of exploitation for the purposes of mass accumulation. This is a form of extractivist violence by making “territories and people extractible (2017, p. 5).” This extractivism “sees territories as commodities, rendering land for the taking, while also devaluing the hidden worlds that forms the nexus of human and nonhuman multiplicity” (5). Gomez-Barris is pointing out that the extractivist logic with which Europe devoured Latin American and enslaved Black Africa is the same logic found within coloniality that led to the accumulation of land and peoples for the purposes of the system of capital.

The metaphor of the Final Frontier—that vast and complex system of colonial and capitalist forms and norms that has tainted the idea of space exploration in the American context since the very beginning—reveal itself to be more than mere metaphor, but also a deceptive image that celebrates nationalism and technology and embeds exploitation and oppression. The Final Frontier is the representation of the cosmic order that is linked with coloniality. The continued use of this ‘metaphor’ produces colonial relations through the invisible assumptions and norms that it contains: the assumption of the definition of humanity; the capitalist-Eurocentric conception of nature; the political norms of hierarchy and violence; the limits placed on the possibilities of the future by the tendency to reproduce the social and political norms of the present. Marx may enable us to better understand the repetitive nature of the Frontier metaphor: “The mode of production of the material means of existence conditions the whole process of social, political and intellectual life. It is not the consciousness of men that determines their existence, but on the contrary, it is their social existence that determines their consciousness” (1943, p. 57) Of course, Marx is only speaking of the conditions of capitalism—the mode of production—yet, as has been shown, capitalism requires colonialization and primitive accumulation. Consequently, it is not only capitalism that has conditioned the minds of men, but also the whole of the existence of the mode and means of production: coloniality. The repetitive nature of the visions of the future in space is a by-product, if

you will, of the limited epistemologies and ontologies available for the thinking-thought of space exploration under coloniality and capitalism. Unintentionally, von Braun, O'Neill, Heppinheimer, Zubrin, Sagan, Reagan, and other advocates of space exploration have limited their imagination, because they could not successfully imagine a state beyond coloniality or capital. To do so would be counterhegemonic. While Turner lamented the closing of the frontier as a sign of stagnation, an idea that Zubrin would take up again in the 1990s, the values Turner linked to the frontier are classically American and masculine. From an American-centric capitalist perspective, pairing the space frontier with the west produced more for America: more land, more resources, more prestige. To repeat Turner:

That coarseness and strength combined with acuteness and inquisitiveness; that practical, inventive turn of mind, quick to find expedients; that masterful grasp of material things, lacking in the artistic but powerful to effect great ends; that restless, nervous energy; that dominant individualism, working for good and evil, and withal that buoyancy and exuberance which comes with freedom - these are the traits of the frontier (1960, p. 28).

Turner's description of the Frontier, and the characteristics he ascribes to the peoples of the frontier, is only that of the Human/Man. The continued disregard for the indigenous peoples, in American and around the globe, is another sign that coloniality is still strong.

Conclusion

Over the course of this project, I have been awed by the sheer number of factors that need to be considered to envision the future in space. Indeed, each theorist, researcher, and study, including my own, has been limited in its scope—a necessary aspect of research—but this is not how life organizes itself or flourishes. One of the factors that requires much more detailed and holistic research is that of space architecture and urban planning. The built environment is an essential aspect of humanity, whether technologically advanced or “primitive.” In space, the built environment—especially within a space station or settlement—will be “the whole world.” These

environments represent an opportunity to reconceptualize nature and space. How can the built environment in space be constructed so as not to produce yet another source of human/nature bifurcation? While “homesteading” has been the analogy of choice for many ideas of the future in space, homesteading still represents the frontier mentality, as well as an individualistic framing that cannot flourish in a space setting. If we consider Marx’s idea that technology expresses the meaning of the human relationship to nature, and that nature in space is harsh and deadly, then how might technology, the very built environment, connect the need for survival to the need for natural connection? How can the architectural form of future space settlements both protect the living population from the harsh realities of space and unknown worlds, while, at the same time, not distance peoples from the cosmos?

In a letter to Stewart Brand written in April of 1976, Wendell Berry states:

You say that what the space colonists consume or destroy outside Earth’s atmosphere will be ‘taken from no one else. There are out of the Earthly ‘zero sum game’ where no groups gain is another’s loss.’ But do we not live in a universe? Is there no ecology of the heavens? You sound like Columbus taking ‘possession’ of the Indies. I think you are only serving up again in space-jargon the ancient fallacy that we are somehow licensed to misbehave when are away from home (1977, p. 82).

This is the third point Berry makes in this letter, which he wrote openly so it might be published later. Indeed, it was published in the Space Colonies issue of the *Whole Earth Catalog*. In this letter, Brand was not thinking about space as a part of the people of the world’s already existing orders that do not exist in relation to the rest of the universe. What Berry is indicating on a deeper level is that the universe is not (yet) ecological. As mentioned in the previously, the conditions of capital and coloniality reduce all things to relations of exploitation. Nature is not nature under coloniality or capital, but rather it is a resource (Mignolo, 2011). And still, Human/Man is still actively on his quest to conquer the universe. Yet there is so much hope in changing this movement from conquering to

experiencing. Nothing is lost when more ways of being and knowing are brought forth. *What is not to be done* is to leave space exploration, the world, and the salvation of the Human/Man to hegemonic forces.

I find both solace and the future in the Moon. That the Moon, in all her glory, is the sister of the Earth we cannot deny. Closeness is a relation that we are forced to confront; it is not a choice. The Moon has guarded both heaven and earth for as long as she has been the companion to this planet. A world of our world. The West, in colonizing the earth, braces itself to colonize the universe. There are a few principles behind this grey that consumes the Earth, the universe: all bodies are similar, but not the same. All life is sacred, but also profane. There is but one truth; all that is, is part of this cycle. As below, so above. The Final Frontier is the Cosmic Order of Coloniality because that is the order of exploitation of humanity and nature. For a ruling cosmic order to reflect liberation, rather than oppression, requires an understanding of the cosmos as relational, not consumable. This is still to happen in hegemonic Western world, where the consumption of the Human/Man has left little time to wonder at the stars. The relation is still distant. For now. And yet, Awe moves beyond that distance. Awe is a different sense. The repetitiveness of the future has left the sense of wonder with nothing to grasp. The Final Frontier is a tried future—it is a future of nothingness. This is why it is hard to move beyond as we have no conception of a life beyond the hegemonic forms of this cosmic order. The stars, the very physicality of space, shows us the way—community, open communications, equity, as space is the borderland. The humanity of the borderland is a humanity of fluidity, of strength and struggle. The nature of the borderland is relationship; it is not for the exploitation of “man.” The Human/Man of the final frontier is exclusionary; it functions through the bastardization of others and hierarchization. To decolonize that which has yet to be colonized is the only way to produce space, not as a colony of the United States, but for the migration and expansion of the peoples of Earth.

The creation, a continuous creation, of a cosmic order in which many cosmic orders exist, without one of them cannibalizing the others is my deepest desire for the future. When Tsiolkovsky wrote the *Necessity of Cosmic Mindset*, I do not think he anticipated the struggle to overcome Western hegemony through engagement with space exploration. Yet, he wrote, “A narrow point of view can lead to a delusion” (1934). The Eurocentric universalism is that delusion. As Dussel writes, “Modernity’s Eurocentrism lies in the confusion between abstract universality and the concrete world hegemony derived from Europe’s position as center” (2002, p. 471). This delusion attempts to reach the stars; yet, in doing so, it starts to crack.

Outer space, that place beyond, so intimately connected to the very essence of how many cultures view themselves, has been reduced to a material resource for the expansion of capitalism, the very structure that has reduced and distorted all animate and inanimate things on this planet. We have seen the mass devastation wrought by capitalism and colonialism; it will take more than just imagining within this oppressive paradigm to create a future of difference. The worlds away from this world offers a moment to reflect, and a possibility to move. Unlike the cries of capitalists and colonialists reacting to the world they built, there is no urgency in our movement into space. It can be a revolutionary act because it can be done with humanity in mind.

Bibliography

- Abbott, C. (2015). *Imagined frontiers : contemporary America and beyond / Carl Abbott*. Norman: University of Oklahoma.
- Aldrin, B. (2004). The Urge to Explore. *Mechanical Engineering*, 125.
- Alimonda, H. (2020). The Coloniality of Nature: An Approach to Latin American Political Ecology. Retrieved from <http://www.alternautas.net/blog/2019/6/10/the-coloniality-of-nature-an-approach-to-latin-american-political-ecology>
- Anzaldúa, G. (Ed.) (2015). *Light in the Dark*. Durham: Duke University Press.
- Anzaldúa, G. (1986). *Borderlands*. San Francisco Aunt Lute Book.
- Anzaldúa, G. (2000). *Interviews = Entrevistas / Gloria E. Anzaldúa*. New York: Routledge.
- Arnould, J. (2014). The explorer's complex. *Space Policy*, 30(4). doi:10.1016/j.spacepol.2014.10.005
- Ateljevic, I. (2013). Visions of Transmodernity: A New Renaissance of our human history? *Integral Review*, 9(2).
- Bainbridge, W. S. (1976). *The spaceflight revolution : a sociological study / William Sims Bainbridge*. New York: Wiley.
- Bainbridge, W. S. (1991a). *Goals in Space*. Albany, New York: State University of New York Press.
- Bainbridge, W. S. (1991b). *Goals in space : American values and the future of technology / William Sims Bainbridge*. Albany: State University of New York Press.
- Bainbridge, W. S. (2009a). Motivations for space exploration. *Futures*, 41(8), 514-522. doi:10.1016/j.futures.2009.04.021
- Bainbridge, W. S. (2009b). Space: The final frontier. *Futures*, 41, 511-513.
- Barker, D. C. (2015). The Mars imperative: Species survival and inspiring a globalized culture. *Acta Astronautica*, 107, 50-69. doi:10.1016/j.actaastro.2014.11.006
- Beery, J. (2016). Terrestrial Geographies in and of Outer Space. In P. Dickens & J. S. Ormrod (Eds.), *The Palgrave Handbook of Society, Culture, and Outer Space* (pp. 47-70). New York, NY: Palgrave MacMillan.
- Bell, S., & Morris, L. (Eds.). (2009). *Living in Space*. California: Aerospace Technology Working Group.
- Bellah, R. (1992). *The Broken Covenant* Chicago: The University of Chicago Press.
- Berger, P. L. (1969). *The Sacred Canopy*. New York: Anchor Books
- Berlet, C., & Lyons, M. N. (2000). *Right_Wing Populism in America*. New York: Guilford Press.
- Bhambra, G. K. (2014). Postcolonial and decolonial dialogues. *Postcolonial studies*, 17(2), 115-121. doi:10.1080/13688790.2014.966414
- Bignami, G. F. (2016). *The future of human space exploration / Giovanni Bignami, Andrea Sommariva*. London: Palgrave Macmillan.
- Billings, L. (1997). Frontier days in Space: Are they over? *Space Policy*, 13(3), 187-190.
- Billings, L. (2006). How shall we live in space? Culture, law and ethics in spacefaring society. *Space Policy*, 22(4), 249-255. doi:10.1016/j.spacepol.2006.08.001
- Billings, L. (2017). Should Humans Colonize Other Planets? No. *Theology and Science*, 15(3), 321-332.
- Blacker, C. (1975). Introduction. In C. Blacker, M. Loewe, & J. M. Plumley (Eds.), *Ancient cosmologies*. London: Allen and Unwin.
- Bloch, E. (1970). Man as Possibility. In W. H. Capps (Ed.), *The Future of Hope*. Philadelphia: Fortress Press.
- Bloch, E. (1996). *The Principle of Hope* (N. Plaice, S. Plaice, & P. Knight, Trans. Vol. 1). Massachusetts: MIT Press.
- Brand, S. (Ed.) (1977). *Space Colonies*. New York: Penguin.
- Brown, E. G. (1978). An Everlasting Frontier. In L. Geis & F. Florin (Eds.), *Worlds beyond : the everlasting frontier*. Berkeley, CA: And/Or Press.
- Calchen, R. (2019, May 6, 2019). "The Eighth Continent: The New Race to the Moon, for Science, Profit, and Pride". *The New Yorker*.
- Castro-Gomez, S. (2008). (Post) Coloniality for Dummies. In M. Morana, E. Dussel, & C. A. Jauregui (Eds.), *Coloniality at Large*. Durham: Duke University Press.
- Clarke, A. C. (1951). *The Exploration of Space*. Greenwich, Conn: Fawcett Premier.

- Clarke, A. C. (1966). *Voices from the sky : previews of the coming space age / Arthur C. Clarke*. London: Gollancz.
- Clarke, A. C. (1973). *Profiles of the future : an inquiry into the limits of the possible / by Arthur C. Clarke* (Rev. ed. ed.). New York: Harper & Row.
- Cockell, C. S. (Ed.) (2015). *Human Governance Beyond Earth* (1st ed. 2015. ed.). Cham: Springer International Publishing.
- Cohen, A. (1992). *The Challenges and Benefits of Lunar Exploration*. Paper presented at the Lunar Materials Technology Symposium, Arizona University.
- Cornish, N. J. (2018, June 23, 2020). What is a Lagrange Point. Retrieved from <https://solarsystem.nasa.gov/resources/754/what-is-a-lagrange-point/>
- Crawford, I. A. (1995). Space development: social and political implications. *Space Policy*, 11, 219-225.
- Crawford, I. A. (2015). Avoiding Intellectual Stagnation: The Starship as an Expander of Minds.
- Cruz, T. (2018). *Destination Mars – Putting American Boots on the Surface of the Red Planet*. Retrieved from <https://www.commerce.senate.gov/2018/7/destination-mars-putting-american-boots-on-the-surface-of-the-red-planet>
- Davenport, C. (2018). *The space barons : Elon Musk, Jeff Bezos, and the quest to colonize the cosmos / Christian Davenport* (First edition. ed.). New York: PublicAffairs.
- Day, D. A. (1995). Paradigm lost. *Space Policy*, 11(3), 153-159. doi:10.1016/0265-9646(95)00017-7
- Day, D. A. (1996). The von Braun paradigm— a response to Harry Ruppe. *Space Policy*, 12(2), 146-147. doi:10.1016/0265-9646(96)84111-7
- de Sousa Santos, B. (2014). *Epistemologies of the South*. New York, NY: Routledge.
- deGrasse, N. T. (2005). *Expanding the Frontiers of Knowledge*. Paper presented at the Looking Backward, Looking Forward: Forty Years of US Human Spaceflight Symposium.
- Dick, S. J. *SEI Summary*. NASA History Office NASA Retrieved from <https://history.nasa.gov/seisummary.htm>
- Dick, S. J., & Launius, R. D. (Eds.). (2007). *Societal impact of spaceflight*. Washington, DC: National Aeronautics and Space Administration, Office of External Relations, History Division.
- Dickens, P. (2007). *Cosmic society : towards a sociology of the universe / Peter Dickens and James S. Ormrod*. London ; Routledge.
- Dickens, P. (2009). The Cosmos as Capitalism's Outside. *The Sociological Review*, 57(1_suppl), 66-82. doi:10.1111/j.1467-954X.2009.01817.x
- Dickens, P. (2010). The Humanization of the Cosmos--To what end. *Monthly Review*, 62(6), 13.
- Dickens, P. (2016). Capitalism, Class and the Cosmos. In P. Dickens & J. S. Ormrod (Eds.), *The Palgrave Handbook of Society, Culture and Outer Space* (pp. 71-93). New York, NY: Palgrave MacMillian.
- Dolman, E. C. (2002). *Astropolitics : classical geopolitics in the Space Age / Everett C. Dolman*. London ; Frank Cass.
- Drexler-Dreis, J. (2019). *Decolonial Love: Salvation in Colonial Modernity*. New York: Fordham University Press.
- Dryden, H. (1961). *The National and International Significance of the Lunar Exploration Program*. Washington DC: NASA
- Dussel, Krauel, J., & Tuma, V. C. (2000). Europe, Modernity, and Eurocentrism. *Nepantla: Views from South*, 1(3), 465-478.
- Dussel, E. (2002). World-Systems and "Trans"-Modernity. *Nepantla: Views from the South*, 3(2), 221-244.
- Dussel, E. (2013). Agenda for a South-South Philosophical Dialogue. *Human Architecture*, 11(1), 3-18.
- Dussel, E. (2016). Transmodernidade e interculturalidade: interpretação a partir da filosofia da libertação. *Sociedade e Estado*, 31(1), n/a. doi:10.1590/S0102-69922016000100004
- Dussel, E. D. (1995). *The invention of the Americas : eclipse of "the other" and the myth of modernity / Enrique dussel; translated by Michael D. barber*. New York: Concium.
- Eisenhower, D. D. (1958). *Statement by the President*. Washington, DC: NASA History Office
- Elias, G. H. (1990). *Breakout into space : mission for a generation / George Henry Elias* (1st ed. ed.). New York: Morrow.
- Elon Musk Unveils Updated Mars Colonization Plan. (2017).
- Escobar, A. (2008). *Territories of difference : place, movements, life, redes / Arturo Escobar*. Durham: Duke University Press.
- FFPiESD. (195). *Space Settlements: A Design Study*. (SP-413). Washington DC: NASA

- Finney, B. R. (1992). Space migrations: Anthropology and the humanization of space. In Foundation, S. F. (2019). Space Frontier Foundation About Retrieved from <http://newspace.spacefrontier.org/about/>
- Gandhi, L. (2019). *Postcolonial theory : a critical introduction / Leela Gandhi* (Second edition ed.). New York: Columbia University Press.
- Gibbs-Smith, C. H. (1974). *Flight through the ages : a complete, illustrated chronology from the dreams of early history to the age of space exploration / by C.H. Gibbs-Smith*. London: Hart-Davis, MacGibbon.
- Glenn, J. C., & Robinson, G. S. (1980). *Space Trek: The Endless Migration*. New York, NY: Warner Books.
- Gomez-Barris, M. (2017). *The Extractive Zone: Social Ecologies and Decolonial Perspectives*. United States: Duke University Press.
- Grierson, P. (1975). The European Heritage. In C. Blacker & M. Loewe (Eds.), *Ancient Cosmologies*. London: Cox and Wynman Ltd.
- Griffin, N. L. (1981). Americans and the Moon Treaty. *The Journal of air law and commerce*, 46(3), 729.
- Grosfoguel, R. (2007). THE EPISTEMIC DECOLONIAL TURN: Beyond political-economy paradigms1. *Cultural Studies: Globalization and the De-Colonial Option*, 21(2-3), 211-223. doi:10.1080/09502380601162514
- Grosfoguel, R. (2009). A decolonial approach to political-economy: transmodernity, border thinking and global coloniality. *Kult*, 6, 10-38. doi:https://www.researchgate.net/publication/281423223_A_decolonial_approach_to_political-economy_transmodernity_border_thinking_and_global_coloniality
- Grosfoguel, R. (2013). The Structure of Knowledge in Westernized Universities: epistemic racism/sexism and the four genocides/epistemicides of the long 16th century. *Human Architecture: Journal of the Sociology of Self-Knowledge*, 11(1), 73.
- Grosfoguel, R. (2018). *Decolonizing Western Universalisms: Decolonial Pluri-versalism from Aime Cesaire to the Zapatistas 1* (1 ed.): Routledge.
- Grosfoguel, R. (Ed.) (2002). *The modern/colonial/capitalist world-system in the twentieth century* Westport, Conn. : Greenwood Press.
- Grosfoguel, R. (Ed.) (2008). *World-System Analysis and PostColonial Studies*. Minneapolis: University of Minnesota Press.
- Group, F. P. T. (1965). *NASA, Summary report: Future Programs Task Group*. Washington DC: NASA History Office
- Haraway, D. (2000) *How Like a Leaf/Interviewer: T. N. Goodeve*. Routledge, New York, NY
- Hardersen, P. S. (1997). *The case for space : who benefits from explorations of the last frontier / Paul S. Hardersen ; foreword by Lori Garver*. Shrewsbury, MA: ATL Press.
- Harris, P. R. (1992). The influence of culture on space developments. In Heppenheimer, T. A. (1977). *Colonies in Space*. Harrisburg, PA: Stackpole Books.
- Hobsbawm, E. (1994). *The Age of Extremes*. London: Time Warner Book Group UK.
- Howell, N. R. (2000). *A feminist cosmology : ecology, solidarity, and metaphysics / Nancy R. Howell*. Amherst, N.Y: Humanity Books.
- Hubbard, B. M. (1989). *The Hunger of Eve*. Washington: Island Pacific NW.
- Jenks, C. W. (1958). *The common law of mankind*. London: Stevens.
- Johnson, H. R. (1970). Civilizations Out in Space. *Brigham Young University Studies*, 11(1), 3-12.
- Johnston, S. P. (1958). *Preliminary Observations on the Organization for the Exploitation of Outer Space Memorandum for Dr. J. R. Killian, Jr. . Exploring the Unknown: NASA History office*
- Kauffman, J. L. (1994). *Selling outer space : Kennedy, the media, and funding for Project Apollo, 1961-1963 / James L. Kauffman*. Tuscaloosa: University of Alabama Press.
- Kearnes, M., & van Dooren, T. (2017). Rethinking the Final Frontier: Cosmo-Logics and an Ethics of Interstellar Flourishing *GeoHumanities*, 3(1), 178-197.
- Keating, A. (2008). "I'm a Citizen of the Universe": Gloria Anzaldúa's Spiritual Activism as Catalyst for Social Change. *Feminist Studies*, 34(1/2), 53-69.
- Keating, A. (Ed.) (2005). *Entre mundos/* (1st ed. ed.). New York: Palgrave Macmillan.

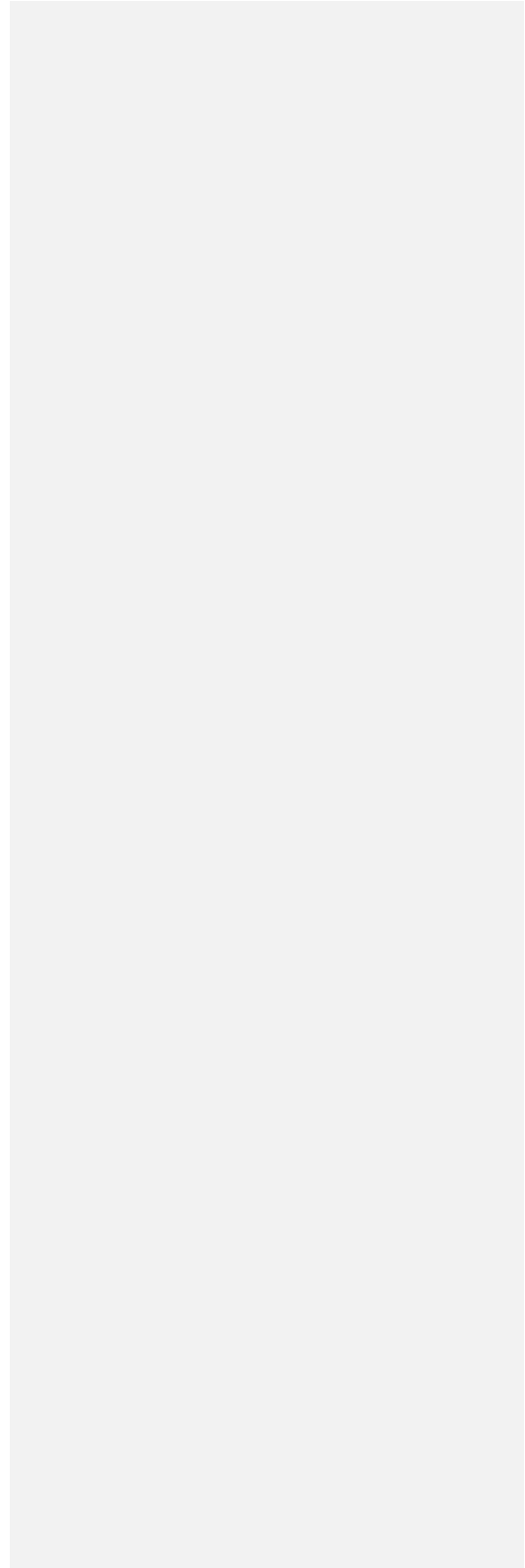
- Keats, J. (1939). Letter to George and Thomas Keats. In W. J. Bate (Ed.), *Negative Capability* Massachusetts: Harvard University Press.
- Kennedy, A. (2016). Overlords, Vassals, Serfs? In C. Cockell (Ed.), *Dissent, Revolution and Liberty Beyond Earth* (1st ed. 2016. ed.). Cham: Springer International Publishing.
- Kennedy, J. F. (1961). *Special message to Congress on urgent national needs, 25 May 1961*. Washington DC: NASA
- Kennedy, J. F. (1962). *John F. Kennedy Moon Speech*. Washington, DC: NASA Retrieved from <https://er.isc.nasa.gov/seh/ricetalk.htm>
- Khasnabish, A. (2008). *Zapatismo beyond borders : new imaginations of political possibility / Alex Khasnabish*. Toronto: University of Toronto Press.
- Kheel, M. (2008). *Nature ethics : an ecofeminist perspective / Marti Kheel*. Lanham: Rowman & Littlefield.
- Krug, L. T. (1991). *Presidential perspectives on space exploration : guiding metaphors from Eisenhower to Bush / Linda T. Krug*. New York: Praeger.
- Krupp, E. C. (1983). *Echoes of the ancient skies : the astronomy of lost civilizations / by E.C. Krupp* (1st ed. ed.). New York: Harper & Row.
- Krupp, E. C. (1997). *Skymatchers, shamans & kings : astronomy and the archaeology of power / E.C. Krupp*. New York: Wiley.
- Krupp, E. C. (2015). Astronomy and power. In *Handbook of Archaeoastronomy and Ethnoastronomy* (pp. 67-92): Springer New York.
- Launius, R. D. (2000). The historical dimension of space exploration: reflections and possibilities. *Space Policy*, 16(1), 23-38. doi:10.1016/S0265-9646(99)00055-7
- Launius, R. D. (2002). Historical Dimensions of the Space Age. In E. Sadeh (Ed.), *Space Politics and Policy: An Evolutionary Perspective* (Vol. 2, pp. 3-25). Boston: Kluwer Academic Publishers.
- Launius, R. D. (2004). *Frontiers of space exploration / Roger D. Launius* (2nd ed. ed.). Westport, CT: Greenwood Press.
- Launius, R. D. (2008). Underlying Assumptions on Human Spaceflight in the United States. *Acta Astronautica*, 62, 341-356.
- Lazarus, N. (2011). What postcolonial theory doesn't say. *Race & class*, 53(1), 3-27. doi:10.1177/0306396811406778
- lefebvre, h. (1991). *The production of space / Henri Lefebvre ; translated by Donald Nicholson-Smith*. Oxford, UK ;; Blackwell.
- Limerick, P. N. (1992). Imagined Frontiers In R. J. Byerly (Ed.), *Space Policy Alternatives*. Boulder: Westview Press.
- Logsdon, J. M. (1995). *Exploring the Unknown: Selected Documents in the History of the U.S. Civil Space Program* (J. M. Logsdon Ed. Vol. 1). Washington DC: NASA.
- Logsdon, J. M. (2010). *John F. Kennedy and the Race to the Moon*. Washington DC: Palgrave Macmillan.
- Logsdon, J. M. (2019a). *Ronald Reagan and the Space Frontier*. Washington DC: Palgrave Macmillan.
- Logsdon, J. M. (2019b). Ten Presidents and NASA. Retrieved from https://www.nasa.gov/50th/50th_magazine/10presidents.html
- Loomba, A. (2005). *Colonialism/postcolonialism / Ania Loomba* (2nd ed. ed.). London ;; Routledge.
- Luxemburg, R. (2003). *The Accumulation of Capital*. London: Routledge.
- Maffie, J. (2014). *Aztec Philosophy*. Bolder, Colorado University Press of Colorado
- Maldonado-Torres, N. (2008). *Against war : views from the underside of modernity*. Durham: Duke University Press.
- Maldonado-Torres, N. (2016). Outline of Ten Theses on Coloniality and Decoloniality.
- Maldonado-Torres, N. (2020). Notes on the Coloniality of Peace. Retrieved from https://fondation-frantzfanon.com/notes-on-the-coloniality-of-peace/#_ftn1
- Maldonado Torres, N. (2014). Race, Religion, and Ethics in the Modern/Colonial World. *Journal of Religious Ethics*, 42(4), 691-711.
- Marcos. (2001). The Story of One and All. In J. P. de Leon (Ed.), *Our Word is Our Weapon*. New York: Seven Stories Press.
- Marcos. (2006). *The other campaign = La otra campaña / by subcomandante insurgente Marcos & the Zapatistas* (Bilingual ed. ed.). San Francisco: City Lights.

- Marshall, A. (1995). Development and imperialism in space. *Space Policy*, 11(1), 41-52. doi:10.1016/0265-9646(95)93233-B
- Marx, K. (1943). Critique of the Gotha Programme. In C. P. Dutt (Ed.), *Karl Marx: Selected Works v. 2* (Vol. 2). London: Lawrence and Wishart Limited
- Marx, K. (2013). *Capital* (Vol. 1). Hertfordshire, GB: Wordsworth.
- Mazlish, B. (1965). *The railroad and the space program ; an exploration in historical analogy*. Cambridge, Mass: M. I. T. Press.
- McCurdy, H. (1997). *Space and the American Imagination*. United States of America: Smithsonian Institution.
- McCurdy, H., & Launius, R. D. (2001). *Imagining Space: Achievements, Predictions, Possibilities 1950-2050*. San Francisco: Chronicle Books.
- McDougall, W. A. (1985). *The heavens and the earth : a political history of the space age / Walter A. McDougall*. New York: Basic Books.
- McMahan, T. (2015). NASA Lays the Groundwork for Homesteading in Space. Retrieved from <https://www.nasa.gov/centers/marshall/news/releases/2015/nasa-lays-the-groundwork-for-homesteading-in-space.html>
- Means, R. (1983). The Same Old Song. In W. Churchill (Ed.), *Marxism and Native American*. Boston: South End Press.
- Merchant, C. (1996). *Women and the Environment*. New York, NY: Routledge.
- Michaud, M. A. G. (1986). *Reaching for the high frontier : the American pro-space movement, 1972-84 / Michael A.G. Michaud ; foreword by Joseph P. Allen*. New York: Praeger.
- Mignolo. (1995). *The darker side of the Renaissance* Ann Arbor, MI: University of Michigan Press.
- Mignolo. (2011). *The darker side of Western modernity*. Durham ;: Duke University Press.
- Mignolo, & Tlostanova, M. (2008). The Logic of Coloniality and the Limits of Postcoloniality. In R. Krishnaswamy & J. C. Hawley (Eds.), *The Postcolonial and the Global* (pp. 109-123). Minneapolis: University of Minnesota Press.
- Mignolo, & Walsh, C. E. (2018). *On Decoloniality : concepts, analytics, and praxis* Durham: Duke University Press.
- Milligan, T. (2015). *Nobody owns the moon : the ethics of space exploitation / Tony Milligan*. Jefferson, North Carolina: McFarland & Company, Inc., Publishers.
- Munevar, G. (2014). Space Exploration and Human Survival. *Space Policy*, 30, 197-201.
- Musk, E. (2017). Making Humans a Multi-Planetary Species *New Space*, 5.
- NASA. (2019). International Cooperation. Retrieved from https://www.nasa.gov/mission_pages/station/cooperation/index.html
- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies 2222 C.F.R. (1967).
- Neal, V. (Ed.) (1994). *Where next, Columbus?* New York: Oxford University Press.
- Nee, S. (2005). The great chain of being. *Nature*, 435(7041), 429-429. doi:10.1038/435429a
- Neufeld, M. J. (2007). *Von Braun : dreamer of space, engineer of war / Michael J. Neufeld* (1st ed. ed.). New York: Alfred A. Knopf.
- Neufeld, M. J. (2008) *How Much Did Werner von Braun Know, and When Did He Know It?/Interviewer: D. Tedeschi*. Air and Space Magazine
- Neufeld, M. J. (2010). The "Von Braun Paradigm" and NASA's Long-Term Planning for Human Spaceflight. In S. J. Dick (Ed.), *NASA's First 50 years: Historical perspectives* (Vol. NASA SP ; 2010-4704). Washington, DC: National Aeronautics and Space Administration, Office of Communications, History Division.
- THE NEXT FRONTIER - SPACE: 1. (1984). In. Philadelphia, Pa: Philadelphia Media Network (Newspapers) LLC.
- O'Neill, G. K. (1977). *The high frontier : human colonies in space / by Gerard K. O'Neill*. New York: Morrow.
- O'Neill, G. K. (1981). *2081 : a hopeful view of the human future / Gerard K. O'Neill*. New York: Simon and Schuster.
- Ossio, J. M. (1997). Cosmologies. *International Social Science Journal*, 49(154), 549-562. doi:10.1111/j.1468-2451.1997.tb00044.x

- Pace, S. (2014). American Space Strategy: Choose to steer, not drift. *Space Policy*, 30, 1-4.
- Platt, C. A., Jason, M., & Sullivan, C. J. (2019). Public Perceptions of Private Space Initiatives: How Young Adults the View SpaceX Plan to Colonize Mars. *Space Policy*, 51.
- Quijano, A. (2000). Coloniality of Power and Eurocentrism in Latin America. *International Sociology*, 15(2), 215-232. doi:10.1177/0268580900015002005
- Quijano, A. (2007). COLONIALITY AND MODERNITY/RATIONALITY. *Cultural Studies: Globalization and the De-Colonial Option*, 21(2-3), 168-178. doi:10.1080/09502380601164353
- Rappenglück, M. A. (2016). Keepers of Time and Guardians of Space. In M. A. Rappenglück, B. Rappenglück, N. Campion, & F. Silva (Eds.), *Astronomy and power : how worlds are structured : proceedings of the SEAC 2010 conference* Oxford, United Kingdom: British Archaeological Reports Ltd.
- Reagan, R. (1986). *Explosion of the Space Shuttle Challenger*
Address to the Nation, January 28, 1986. Washington DC: NASA
- Rilke, R. M. (1984). *Letters to a Young Poet* (S. Mitchell, Trans.). New York: The Modern Library.
- Ritzer, G. (2008). *The McDonaldization of society 5 / George Ritzer*. Thousand Oaks, Calif: Pine Forge Press.
- Sadeh, E. (2002a). Space Politics and Policy: An Evolutionary Perspective. In E. Sadeh (Ed.), *Space Politics and Policy: An Evolutionary Perspective* Boston: Kluwer Academic Publishers.
- Sadeh, E. (Ed.) (2002b). *Space politics and policy : an evolutionary perspective* Dordrecht: Kluwer Academic.
- Sagan, C. (1994). *Pale Blue Dot*. Random House New York.
- Sage, D. (2008). Framing Space: A Popular Geopolitics of American Manifest Destiny in Outer Space. *Geopolitics*, 13, 27-53.
- Salt, D. (2013). Newspace __delivering on teh dream. *Acta Astronautica*, 92, 178-186.
- Schuster, H., & Peck, S. (2016). Mars ain't the kind of place to raise your kid: ethical implications of pregnancy on missions to colonize other planets. *Life Sciences, Society and Policy*, 12(1), 1-8. doi:10.1186/s40504-016-0043-5
- Schwartz, J. S. J. (2017). Myth-Free Space Advocacy Part II: The Myth of the Space Frontier. *Astropolitics*, 15(2), 167-184.
- Schwartz, J. S. J. (2018). Space Settlement: What's the Rush? *Futures*.
- Science and Astronautics, C. o. (1960). *The Practical Values of Space Exploration*. (2091). The Project Gutenberg
- Shaghghi, A., & Antonakopoulos, K. (2012). The Societal Impacts of a Mars Mission in the Future of Space Exploration. *Physics Procedia*, 38(C), 176-185. doi:10.1016/j.phpro.2012.08.021
- Shammas, V. L., & Holen, T. B. (2019). One giant leap for capitalistkind: private enterprise in outer space. *Palgrave communications*, 5(1), 1-9. doi:10.1057/s41599-019-0218-9
- Smith, C. M. (2015). An Adaptive paradigm for human settlement. *Acta Astronautica*, 119, 207-217.
- Sommariva, A. (2015). Rationale, Strategies, and Economics for Exploration and Mining of Asteroids. *Astropolitics*, 13, 25-42.
- Space Programs Aren't for the Faint of Heart.(Editorial Desk). (1989). In: The New York Times Company.
- Space Renaissance International. World, C. (2017). *From space exploration to space settlement : Space Renaissance International 2nd World Congress 2016 : theses, complete acts, and the December 2016 position paper on Civilian Space Development / assembled by Adriano V. Autino ; editor, Ginevra F. Autino*. San Bernardino, CA: Createspace Independent Publishing Platform.
- Spivak, G. C. (2010). *Can the subaltern speak? : reflections on the history of an idea* New York: Columbia University Press.
- Steele, J. M. (2015). *Astronomy and politics*. Springer New York.
- Stephanson, A. (1996). *Manifest destiny : American expansionism and the empire of right / Anders Stephanson* (1st pbk. ed. ed.). New York: Hill and Wang.
- Sterling Saletta, M., & Orrman-Rossiter, K. (2018). Can space mining benefit all of humanity?: The resource fund and citizen's dividend model of Alaska, the 'last frontier'. *Space Policy*, 43, 1-6. doi:10.1016/j.spacepol.2018.02.002
- Stine, G. H. (1983). *The hopeful future / G. Harry Stine*. New York: Macmillan.
- Sun, X. (2015). Observation of Celestial Phenomena in Ancient China. In C. L. N. Ruggles (Ed.), *Handbook of Archaeoastronomy and Ethnoastronomy* (pp. 2043-2049). New York, NY: Springer New York.

- Szocik, K., Abood, S., Impey, C., Shelhamer, M., Haqq-Misra, J., Persson, E., . . . Corbally, C. (2020). Visions of a Martian future. *Futures*, 117. doi:10.1016/j.futures.2020.102514
- Szocik, K., Lysenko-Ryba, K., Banas, S., & Mazur, S. (2016). Political and Legal challenges in Mars Colony. *Space Policy*.
- Szocik, K., Marques, R. E., Abood, S., Kędzior, A., Lysenko-Ryba, K., & Minich, D. (2018). Biological and social challenges of human reproduction in a long-term Mars base. *Futures: the journal of policy, planning and futures studies*, 100, 56-62. doi:10.1016/j.futures.2018.04.006
- Tarnas, R. (2006). *Cosmos and psyche: intimations of a new world view / Richard Tarnas*. New York: Viking.
- Taylor, L. B. (1974). *For all mankind: America's space programs of the 1970s and beyond / L.B. Taylor, Jr. ; foreword by Werner von Braun* (1st ed. ed.). New York: Dutton.
- Torres, P. (2018). Space colonization and suffering risks: Reassessing the "maxipok rule". *Futures*, 100, 74-85. doi:10.1016/j.futures.2018.04.008
- Trager, O. (Ed.) (1986). *America in space: pioneers or aggressors? / edited by Oliver Trager*. New York, N.Y: Facts on File Publications.
- Tsiolkovsky, K. (1934). Necessity of Cosmic mindset. Retrieved from <https://tsiolkovsky.org/en/the-cosmic-philosophy/necessity-of-cosmic-mindset-1934/>
- Turner, F. J. (1921). *The frontier in American history*, by Frederick Jackson Turner. New York: H. Holt and company.
- Turner, F. J. (1960). *The significance of the frontier in American history, with an introduction by John Alexander Carroll*. El Paso, Texas: Academic reprints, inc.
- United States. National Commission on, S. (1986). *Pioneering the space frontier / the report of the National Commission on Space*. New York, NY: Bantam Books.
- Valentine, D. (2012). Exit Strategy: Profit, Cosmology, and the Future of Humans in Space. *Anthropological Quarterly*, 85(4), 1045-1067.
- Vedda, J. A. (2002). Space Commerce. In E. Sadeh (Ed.), *Space Politics and Policy*. Boston: Kluwer Academic Publishers
- Venus May Tell Us How to Escape Its Fate; The Next Giant Step. (1989). In: The New York Times Company.
- Von Braun, W. (1952). Crossing the Last Frontier. In J. M. Logsdon (Ed.), *Exploring the Unknown* (Vol. 1, pp. 179-188). Washington DC: NASA.
- von Braun, W. (1991). *The Mars Project*. Chicago: University of Illinois Press.
- Ward, B. (1966). *Spaceship earth / [by] Barbara Ward*. New York: Columbia University Press.
- Webb, W. P. (1952). *The Great Frontier*. Boston: Houghton Mifflin.
- Weger, U., & Wagemann, J. (2018). Towards a conceptual clarification of awe and wonder: A first person phenomenological enquiry. *Current Psychology*. doi:10.1007/s12144-018-0057-7
- White, F. (1987). *The Overview Effect*. Boston: Houghton Mifflin Company.
- Wilkins, J. (1638). *The discovery of a world in the moone, or, A discourse tending to prove, that 'tis probable there may be another habitable world in that planet*.
- Williamson, R. A. (1987). Outer Space as Frontier: Lessons for Today. *Western Folklore*, 46(4), 255-267.
- Wynter, S. (2003). Unsettling the Coloniality of Being/Power/Truth/Freedom: Towards the Human, After Man, Its Overrepresentation--An Argument. *CR: The New Centennial Review*, 3(3), 257-337. doi:10.1353/ncr.2004.0015
- Yaden, D. B., Iwry, J., Slack, K. J., Eichstaedt, J. C., Zhao, Y., Vaillant, G. E., & Newberg, A. B. (2016). The overview effect: Awe and self-transcendent experience in space flight. *Psychology of Consciousness: Theory, Research, and Practice*, 3(1), 1-11. doi:<http://dx.doi.org/10.1037/cns0000086>
- Young, B. (2011). Neoliberalism. In (Vol. 5, pp. 1676-1679).
- Young, M. J. (1987). "Pity the Indians of Outer Space": Native American Views of the Space Program. *Western Folklore*, 46(4), 269-279. doi:10.2307/1499889
- Zubrin. (2002). Pushing Human Frontiers. In S. J. Garber (Ed.), *Looking backward, looking forward: forty years of U.S. human spaceflight symposium* (pp. 137-148). Washington, DC: National Aeronautics and Space Administration, Office of External Relations, NASA History Office.
- Zubrin, R. (1999). *Entering Space Creating a Spacefaring Civilization*. New York: Jeremy P. Tarcher/Putnam.
- Zubrin, & Wagner. (1996). *The Case for Mars*

The Plan to Settle the Red Planet and Why We Must. New York: The Free Press.



Curriculum Vitae

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The Centre for the Study of Theory and Criticism
Western University
London, Ontario Canada

Education

Doctor of Philosophy, Theory and Criticism August 2014-October 2020
The Centre for the Study of Theory and Criticism, **Western University**, London, Ontario Canada

- Selected Specializations: Space Exploration, Space policy, Decolonial Theory.

Master of Arts, Liberal Studies August 2012- June 2014
Department of Liberal Studies, **DePaul University**, Chicago, Illinois USA

- Selected Specializations: Social and political theory.

Bachelor of Arts, Liberal Studies August 2009-August 2011
Department of Liberal Studies, **Grand Valley State University**, Allendale, Michigan USA

- Specialization: Communications, International Relations and Globalization

Relevant Experience

Graduate Teaching Assistant for Sociological Theory September 2015-May 2018
Department of Sociology, **Western University**, London, Ontario Canada

- Facilitated weekly, hour-long discussion sessions for assigned reading.
- Helped develop, prepare, and deliver course materials.
- Guest Lectured on topics including Marxism, feminist theory, critical reading and thinking, critical race theory.
- Marked midterm, final exams, and research essays.
- Assessed the academic work of students
- Reported grades and participated in resolving student appeals.
- Attended to student's learning and writing needs during office hours.
- Mentored upper level students with graduate school applications.

Graduate Teaching Assistant for Introduction to Women's Studies September 2014-May 2015

Department of Women's Studies and Feminist Research, **Western University**, London, Ontario
Canada

- Facilitated weekly, hour long discussion sessions related to assigned readings including readings on Women in Politics, Globalization, and Feminist Political Theory.
- Guest Lectured on Feminist Political Theory.
- Motivated and Provided supported to students during office hours.
- Marked weekly assignments –provided feedback, marked exams and research essays.

Invitations

Panelist March 4, 2017
"Final Round Table," Toxic/City Conference, Western University, London, Ontario Canada

Workshop Co-Facilitator March 6, 2017
"Dissertation Planning and Writing: Staying Well during your PhD,"
The Centre for the Study of Theory and Criticism, Western University, London, Ontario Canada

Speaker September 2012
"Benefits of Liberal Education beyond University," Grand Valley Liberal Studies Conference, Grand Valley State University, Allendale, Michigan USA

Conferences

"Is there a Future in Space?" March 2019
Medusa Conference University of Toronto, Toronto, Ontario Canada

"To Thrive: Experiences of Non-Traditional Female Students" April 2011
Grand Valley State Student Scholars Day, Grand Valley State University, Allendale, Michigan USA

"Feminist Leadership: Collaboration" February 2011
Grand Valley Leadership Conference, Grand Valley State University, Allendale, Michigan USA

Honors**Graduate Teaching Award (\$500)**

2017-2018

Society of Graduate Students, Western University, London, Ontario Canada

Graduate Teaching Award (\$500)

2015-2016

Society of Graduate Students, Western University, London, Ontario Canada

Dean's Entrance Scholarship (\$2000)

2014-2015

School of Graduate and Post-Doctoral Studies, Western University, London, Ontario Canada