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Martian Mother

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Fine Art at Virginia Commonwealth University

By

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Master of Fine Art
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ABSTRACT

MARTIAN MOTHER

By Elizabeth McGrady

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Fine Art at Virginia Commonwealth University.

Virginia Commonwealth University, 2020

Major Director: Paul Thulin
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This paper examines the relationship between humans and land, through the lens of the scientific and religious, bridging the physical realm with the spiritual. It acts as accompanying material to the project titled *Martian Mother*, supplementary information to the visual work, and an extension of the proposal, the center of the work. The proposal exists to send myself, or a like-minded individual, to Mars with artificial insemination equipment to give birth to the first Martian, becoming the first Martian Mother. This work is rooted firmly in speculative fiction, creating a nonlinear future framework for a new society and space exploration.

I. Introduction

The human fascination with space began before accessing it was in the realm of possibility. Ancient civilizations devised various mythologies and religions around the cosmos, stories that have become the foundation of modern spirituality. Interest in reaching beyond our planet comes from an inherent desire to search for something other, a force existing beyond our understanding, holding the secrets of the universe.

The planet Mars holds the key to understanding our relationship with the cosmos. Mars has come to represent the possibilities we see in the rest of the galaxy from the beginning of both science and science fiction. For years, people have theorized that Mars contains signs of life, whether that be in the form of little green beings or bacteria, which indicate we are not alone. Mars is the stepping stone to human expansion beyond our solar system as once we are able to live on that planet successfully, we can extend our reach beyond. There is magic in our fascination with this planet, a kind of unwavering belief and obsession with expanding human knowledge and our understanding of the universe.

The settlement of Mars is no easy feat. The planet is by its very makeup inhospitable to human life. The atmosphere is thinner, giving less protection from space radiation, in addition to the lack of oxygen, water, and warmth. These conditions have not stopped or slowed humans to reach for what seems unattainable, with privatized space industry giants continuously designing programs to put humans on the planet's surface in the

next thirty years. With the current situation on our planet, many see the settlement of Mars as the only logical next step. Reminiscent of the previous space race to put a man on the Moon, the competition to expand to Mars is also fueled by complicated political agendas, standing as the next step in groundbreaking human achievement.

Settlement missions to Mars appear distant but, in reality, are much closer than many civilians realize. At a recent conference in Guadalajara, México, Elon Musk predicted a human-crewed mission to Mars led by SpaceX in our lifetime.¹ Until we discover a fuel source with smaller mass, trips to Mars are one-way due to our inability to carry enough fuel for both the journey there and back. This indicates that any crewed trip to Mars would be a settling trip. The astronauts would not have a chance to return to Earth for years, at the very least. Among the many implications resulting from such a mission is perhaps the most glaringly obvious as it is the core tenet to the cycle of life, pregnancy.

Martian Mother is an argument to seriously consider the intricacies of this before an accidental pregnancy leads to the creation of the first Martian in our lifetime. The project exists as a framework, positioning myself at the center as an example, yet open to the possibilities of another like-minded individual who would volunteer for the one-way journey.

¹ Rebecca Hersher and Camila Domonoske, "Elon Musk Unveils His Plan For Colonizing Mars," NPR (NPR, September 27, 2016), <https://www.npr.org/sections/thetwo-way/2016/09/27/495622695/this-afternoon-elon-musk-unveils-his-plan-for-colonizing-mars>)

Martian Mother examines the question of the first Martian by focusing on the process leading to birth, fertilization and pregnancy, and the intrinsic link between this process and space exploration. The project is ongoing, with this installment focusing on moments leading up until the physical moment of birth, theorizing that the moment of birth and the moment of the singularity are inherently tied. I examine myself as Host, in a movement to discuss the female body in regards to reproduction, how it has manifested historically in both feminism and queer theory, and examine the human body as a scientific instrument. Further, the work draws ties between land and the female body, examining the physical landscape of both Mars and the universe as analogous to the female reproductive system. Additionally, the work theorizes that the female experience is cyclical, drawing on mythology as well as core principles of Celtic Paganism, to explore the inter-dimensional slippage of time as it relates to the physicality of black holes.

The birth of the first human Martian must be considered well in advance as the implications of this birth are groundbreaking for the human race. This child will be the first citizen of a new planet and, subsequently, the first foothold in a long future of space exploration. This proposal exists as a foundational framework for this process, not as a prescriptive text to be followed word for word. The text explores implications of this mission and considers them through the lens of the first volunteered Martian Mother, Elizabeth McGrady, referred to as Host from this point forward.

New participants in this framework are heavily encouraged, if not integral to the future of this endeavor. The first child will be born into a new familial formation that will disintegrate the nuclear family structure. The child will form parental relationships with members of the community that are not the child's biological parents. This structure will draw from the structure of many queer communities, centering the concept of chosen family and community-led learning. The work engages pregnancy from various viewpoints through the lens of feminism and queerness rooted in science fiction and speculative fiction. I address the physical, material world through an examination of land and the immaterial, mystical world through spirituality and mythology.

Further, this work relies on a different definition of female than the biological. The contemporary pagan community has expanded the understanding of the female body to include transgender and gender non-conforming individuals. The state of femaleness does not rely on biology. Rather it relies on the female experience, a state of being. In the discussion of the uterus, it is not in reference to the organ itself, but the magical properties inherent to the cyclical female experience. This rethinking is a crucial aspect in the discussion of future civilizations and the queering of our understanding of science. Once connections between biology and the female experience are severed, our understanding of the functions of female-identifying bodies expands, and the spiritual connection between those who identify as female can be fully explored.

II. Establishing Homotopia: The Queering of Mars

In *Des Spaces Autres* or *Of Other Spaces*, Michel Foucault defines a heterotopia as space outside of a place, that exists as a reflection of a particular space and a critique of the space it reflects. Heterotopias follow six specific principles:

1. No culture within history does not contain within itself one or more heterotopias. They are inherent to the culture's existence.
2. The function of heterotopias are subject to change over time; the way they operate within the culture that they exist is in constant flux.
3. Heterotopias conflate a wide variety of spaces, overlapping multiple real spaces that seem incompatible as one.
4. They represent multiple sections of time in one space, in that there appears a slippage of time and connections between seemingly disparate periods contained.
5. Heterotopias are simultaneously open and closed in terms of access; they are separate and isolated but require a specific set of actions for a being to access the space.
6. Lastly, they have a precise relationship to the space they exist within. This relationship takes one of two forms: either the heterotopia reveals critique of the space they exist within by mirroring to such a perfect degree that the critique is exposed or they reveal critique through existing as a direct opposite of the space they exist within.

Foucault directly refers to the sea and ships as “heterotopia(s) par excellence,” in that “the boat is a floating piece of space, a place without place, that exists by itself, that is closed in on itself and at the same time is given over to the infinity of the sea.” Further, he refers to the boat as “the greatest reserve of the imagination.”²

Let us examine space as a heterotopia, specifically Mars. Our relationship with the planet has changed over time, from astrological wonder and the manifestation of Gods to a wealth of scientific exploration to holding the possibility that we are not alone in the universe. This slippage between functions in our society also represents a slippage of time. Mars is simultaneously ancient and contemporary, referencing our ancient relationship to the cosmos as well as our ever-expanding technological capabilities. It is closed regarding access, requiring a precise process to enter the space that humans have continuously been struggling to achieve. Fascination with the search for liquid Martian water reflects our desire to see the space as reflective of Earth, as a double for this planet. Therefore, the planet fits Foucault’s carefully designed criteria.

However, as is previously mentioned, this work is a queering of science. Foucault’s outlining of the boat as the perfect heterotopia relies on a long history of straight white men utilizing the boat to inflict colonialism, slavery, and unequal societal structures upon those who do not have access or privilege to command the sea. Therefore, we must consider the settlement of Mars to be outside of this longstanding framework if the settlement will be in any way an improvement upon our current society. I will not

² Michel Foucault and Jay Miskowiec. “Of Other Spaces.” *Diacritics* 16, no. 1 (1986): 22-27. doi:10.2307/464648.

volunteer another female-identifying person for the one-way trip to Mars. However, this proposal is open to any volunteers for this mission for many reasons, one of which is my identity as a white woman. White populations have, in history, been the driving force behind the expansion mentioned above of colonialism and slavery, and this project should in no way be an extension of that.

As such, the proposed settled planet of Mars must be considered a homotopia. It is not merely a reimagining of the term to queer these theories but as a reference to a seventh principle by which the proposed settlement must abide. The seventh principle to expand the term heterotopia to homotopia dictates that the entity must be critical of the heteronormative structure that it reflects. The replacement of “hetero” for the Latin root “homo” in the term homotopia references the leveling of the playing field, of dismantling of a heteronormative system in the acceptance of all bodies as equal. Furthermore, the nod to the combination of the terms “homosexual” and “utopia” is not accidental. This proposed society will be an imagining of a world devoid of heteronormative oppression. This utopia establishes space as queer space and the expansion of humanity into the cosmos as an opportunity to right centuries of suffering in the current heteronormative structure of our society.

III. Mother Earth, Mother Mars

“The female powers dwell not only in ponds, springs, streams, and swamps, but also in the earth, in mountains, hills, cliffs, and – along with the dead and the unborn – in the underworld. And above all, the mixture of the elements water and earth is primordially feminine; it is the swamp, the fertile muck, in whose uroboric nature the water may equally be experienced as male and engendering and as female and life-giving.” Erich Neumann, *The Great Mother*.³



1. Elizabeth McGrady, *My time has not yet come*, Archival inkjet print, book spread (2020)

³ Erich Neumann and Ralph Manheim, *The Great Mother: An Analysis of the Archetype* (Princeton, NJ: Princeton University Press, 2015))

The connection between the female form and earth is deeper than a physical one; the connection manifests on a spiritual plane. It is important to note that this reference to earth is not a reference to the planet itself but a definition that encompasses the planet's biological material, including all soil, stone, and water. In *Overlay: Contemporary Art and Prehistory*, Lucy Lippard states that the physical form of geological formations is mirrored in the female form, "our genitalia recall caves, cleft rocks, and river beds." Further, she states that the innate powers of those formations are mirrored in the female body, that the "cozy and fearful abysses culturally associated with the nourishing and the fearsome, with the maternal and sexual, the regenerative and deathly aspects of the Earth Mother."⁴



2. Elizabeth McGrady, *Cracked*, Archival inkjet print, book spread (2020)

⁴ Lucy Rowland Lippard, *Overlay* (New York: Pantheon Books, 1983), 42.

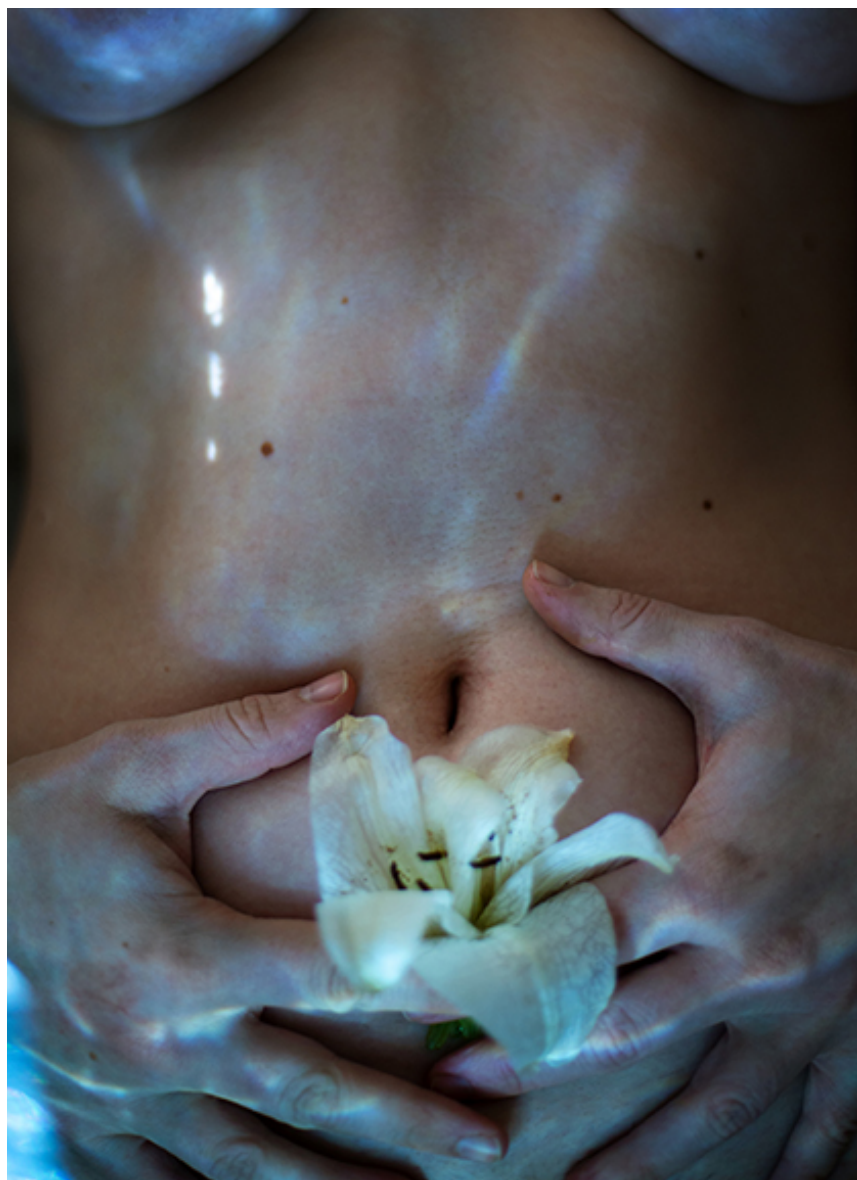
It is not clear which came first in the connection between goddess and earth, the establishment of the goddess as an extension of earth or earth as an extension of the goddess. As evidenced by goddesses such as the Korean goddess MaGo who created the Earth through song or the Greek goddess Eurynome who created the Earth through dance, the connection between goddess and the planet is deeply rooted. The Earth has been theorized as a maternal being, fostering and giving life to all its inhabitants. The Earth's treatment as a fertile human body has roots in the Estonian goddess Ma-Emma and the Roman goddess Anna Perenna, fostering human fertility and controlling the pregnancy of earthly beings.⁵

These goddesses are examples of an archetype that is universal among pagan religions, a divine female character who is intrinsically linked to the planet and often associated with abundance and creation. Women's bodies have been connected to land since the creation of these religions, extending as far back in religious texts and myths to the creation of the planet. This relationship manifests in modern-day, from environmental groups referring to the earth as Gaia, to the language surrounding women's bodies, and the use of the words barren and fertile to describe both wombs and land. In Patricia Monaghan's *Encyclopedia of Goddesses and Heroines*, she states:

“All aspects of life, from birth to death, have been connected in some culture to a goddess, spirit, or mythic heroine. Even impregnation, apparently a male activity, is found in stories of goddesses who become parthenogenetically pregnant. The scope of goddess

⁵ Patricia Monaghan, *Encyclopedia of Goddesses and Heroines [2 Volumes]* (Santa Barbara, Calif: Greenwood, 2010), Vol. 1, xxviii.

imagery includes... not only natural objects but also abstractions and stages of life."⁶



3. Elizabeth McGrady, *The Birth of Mars*, Archival inkjet print, book spread (2019)

⁶ Patricia Monaghan, *Encyclopedia of Goddesses and Heroines [2 Volumes]* (Santa Barbara, Calif: Greenwood, 2010), Vol. 1, 1.

Even mythology of the Roman God of Mars' birth, which the planet is named after, falls into this discussion of parthenogenetic pregnancies. Ovid's *Fasti* provides one of the only myths surrounding Juno, the goddess of pregnancy and childbirth.⁷ According to the tale, Juno wanted to get pregnant without a male's involvement and sought out Flora, the goddess of flowers and prostitutes.⁸ Flora remembered a flower that she had previously used to get a female cow pregnant by pressing the flower to the cow's stomach. She then pressed the same flower to the belly of Juno, immediately impregnating her, and Mars was born.⁹

Mars is the son of two mothers, a fact that haunted Flora after the birth as she faced the dilemma of telling Mars that she was, in fact, his parent. The planet was birthed by two female goddesses. They instilled in the land the nature of the female experience and the ability to create and destroy life through the power of the female body.

⁷ The Editors of Encyclopedia Britannica, "Juno," Encyclopedia Britannica (Encyclopedia Britannica, Inc., May 27, 2019).

⁸ Patricia Monaghan, *Encyclopedia of Goddesses and Heroines [2 Volumes]* (Santa Barbara, Calif: Greenwood, 2010), Vol. 2, 454.

⁹ Paul Murgatroyd, *Mythical and Legendary Narrative in Ovids Fasti* (Leiden: Brill, 2005)) 51-52.



4. Elizabeth McGrady, *Garden of Olenus*, Archival inkjet print, book spread (2019)

IV. Event Horizon

The following theory posits intrinsic connections between the uterus, the black hole, and the Celtic pagan Triad of Brigid. I explore the theory logically, breaking down the individual declarations sentence by sentence and using a combination of construction and combinatorial proofs. Devised from mathematics, a proof by construction refers to proving the validity of a theorem by showing it exists in another form. In contrast, a combinatorial proof relies on showing the similarities between two theorems to assert that something already proven to be an attribute of one, is an attribute of the other. Although this is a discussion of theories that lie outside of the field of mathematics, the proving strategies form clear linear connections between seemingly disparate entities.

A black hole is a tear in the space-time continuum, and a being exists within that tear as every version of themselves, across all parallel universes, simultaneously. The Triple Goddess, an archetype found in a wide range of pagan religions, is discussed in its relation to Celtic paganism, specifically the Triad of Brigid. The Triad contains Maiden, Mother, and Crone. The Triad, and the Triple Goddess as a whole, represents the female experience's cyclical nature. The female uterus mimics the structure of the black hole, both in shape and in understanding within the scientific community. Furthermore, the uterus functions as a being existing in a black hole. The Host, containing the uterus, exists as an extension of the organ status, simultaneously as Maiden, Mother, and Crone. The Host exists and will continue to exist as her former, current, and future self, contained in one form.

Theory: *A black hole is a tear in the space-time continuum, and a being exists within that tear as every version of themselves, across all parallel universes, simultaneously.*

Our understanding of black holes is mostly hypothetical, as we have only been able to collect scientific data of the formations from an extreme distance. The first theories of a formation in the universe that absorbed light rather than emitting or reflecting it arose in the late 1700s, with references to such an entity in papers by scientists John Mitchell and Marquis de Laplace. However, the actual term “black hole” was only created by John Wheeler in 1969.¹⁰

Scientists base our understanding of black holes from our understanding of the physics of space until a being enters a black hole, at which point our understanding of physics breaks down. We are no longer able to use the rules we apply to our understanding of the universe to that body. This moment is commonly referred to as the singularity and is addressed in Section VI.

We now consider the state of a being before the point of singularity when a black hole wholly consumes it. The force of gravity and the curvature of the space-time continuum surrounding and absorbing a body on the brink of a black hole will have different varying levels of force on the subject. In *A Brief History of Time*, Stephen Hawking states that if we consider a human as the subject on the edge of a black hole, “the difference in the

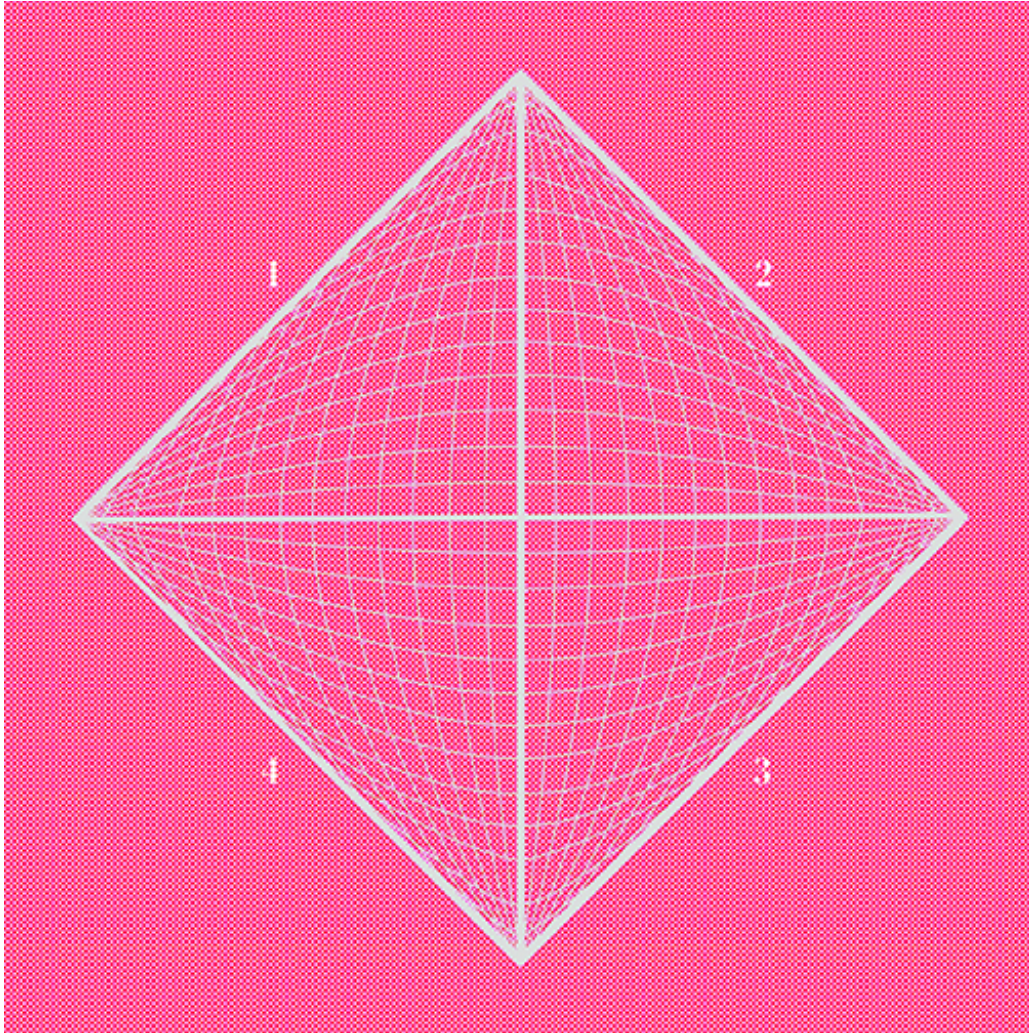
¹⁰ Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), 82-83.

forces would stretch our astronaut out like spaghetti” such that “the gravitational force would quite literally pull the head of the astronaut from the feet.”¹¹

This state can be theorized as a series of events, happening at a particular point in space, where the subject cannot escape the gravitational pull. The foundational property of a black hole is that light rays cannot escape the force of gravity. The theory of relativity states that nothing can travel faster than the speed of light. Therefore, no entity at this point of a black hole can travel fast enough to escape either. This location, where escape is no longer physically possible, is referred to by scientists as the “event horizon,” which “coincides with the paths of light rays that just fail to escape from the black hole.”¹² The physics of the event horizon are depicted by the diagram of the same name by Roger Penrose, an imagining of the light rays’ structure as they bend towards a black hole.

¹¹ Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), 90.

¹² Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), 88.



5. Elizabeth McGrady, *Penrose Diagram*; Poppy, Archival inkjet print, book spread (2019)

Consider that the breakdown in physics surrounding this human travelling through a black hole, as having no effect on any entity observing the absorption of the human. This extends to fellow astronauts, a body on a nearby planet, a traveling satellite, even a meteor and is referred to as a “naked singularity.”¹³ It is theorized, without tangible

¹³ Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), 91. Hawking theorizes the “naked singularity” is an event that occurs without observation, as the parties observing a being entering a singularity would be affected by the breakdown in the laws of physics. Should a singularity be “decently hidden from the outside view by an event horizon,” the effect of a singularity is slightly easier to theorize. Should a singularity be observed in regards to a black hole, there is no predicting how far the breakdown in physics reaches.

proof, that this being “may be able to avoid hitting the singularity and instead fall through a “wormhole” and come out in another region of the universe.”¹⁴ In this theory clearly lies the potential for time travel.

For a moment, let us consider the thought experiment of Schrodinger’s Cat. The potential experiment, theorized by Schrodinger in an in-depth paper examining quantum mechanics, posits a cat contained in a steel chamber. Also contained is a small amount of radioactive substance that could poison and kill the cat upon consumption but would not destroy the chamber. An observer that could not tell the state of the cat through the steel chamber, either by sight or by sound, waits for the appropriate amount of time it would take the poison to kill the cat. At this point, because the observer has no way to know the cat’s status, the cat can be considered to be both alive and dead at the same time. Inside the steel box, all outcomes are entirely possible; therefore, all possibilities exist within it.¹⁵

¹⁴ Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), 91.

¹⁵ Erwin Schrodinger, “The Present Situation in Quantum Mechanics.” Translated by John D. Trimmer. *Proceedings of the American Philosophical Society* 124 (1980): 323-338.



6. Elizabeth McGrady, *Event Horizon*, Archival inkjet print, book spread (2020)

As a human on the edge of a black hole in a naked singularity could possibly fall through a wormhole and reappear in another region on the space-time continuum, the being entering the wormhole exists as a version of Schrodinger's Cat. She exists on all planes of existence, in all possibilities of travel through time and space, at once.

Theory: *The Triple Goddess, an archetype found in a wide range of pagan religions, is discussed in its relation to Celtic paganism, specifically the Triad of Brigid. The Triad contains Maiden, Mother, and Crone. The Triad, and the Triple Goddess as a whole, represents the cyclical nature of the female experience.*

One of the first written recordings of the Triple Goddess in modern pagan literature was in the writing of Aleister Crowley, specifically *Moonchild*.¹⁶ The exact origin of the Triple Goddess is vague, as the traditions that celebrated her were oral. However, Jane Ellen Harrison, a Classics scholar at Cambridge University, theorized that the “pagan ancient world had sometimes believed in partnerships of three divine women” and that the goddess of the Earth “had likewise been honoured in three roles.”¹⁷

Janet and Stewart Farrar, two crucial writers in the founding of modern Witchcraft and Neopaganism, compiled two handbooks into a single volume, *A Witch's Bible*, which was one of the first step-by-step guides to ritual practice translated from oral tradition to the written word. This writing established the tie between the Goddess Brigid (also referred to as Brid or Brigante), the Moon, and the Triple Goddess. The Moon's phases

¹⁶ Aleister Crowley, *The Moonchild* (Feedbooks, 1917), 309-311. In this exploration of pagan Gods and Goddesses, Crowley refers to the female experience as reliant on the Moon, splitting this into three phases. The Moon, and extending this to the goddess and therefore the woman, “is Artemis or Diana, sister of the Sun, a shining Virgin Goddess; then Isis-initiatix, who brings to man all light and purity, and is the link of his animal soul with his eternal self; and she is Persephone or Proserpine, a soul of double nature, living half upon earth and half in Hades, because, having eaten the pomegranate offered her by its lord, her mother could not bring her wholly back to earth; and thirdly, she is Hecate, a thing altogether of Hell, barren, hideous and malicious, the queen of death and evil witchcraft.” It is important to note that Crowley writes this from an antiquated view of the female experience, from early discussions of the goddess. The writing of Crowley should be taken with the context of the time period in mind.

¹⁷ Ronald Hutton, *The Triumph of the Moon: A History of Modern Pagan Witchcraft* (Oxford: New York, 1999), 36-37.

were often joined to those of the female experience through life stages and the menstrual cycle. Denoting the Moon as a symbol of the goddess, Farrar further explains that “the Moon above all stands for her threefold aspect of Maid, Mother and Crone (Enchantment, Ripeness, and Wisdom).”¹⁸ Most notably, Farrar expounds on paganism’s ritual proceedings in the second book of *The Witches’ Bible* and examines the Three Goddess Ritual.¹⁹ Perhaps the most succinct explanation of the relationship between the female experience and the Triple Goddess, Farrar explains:

“All Goddesses are one Goddess – but she shows herself in many aspects, all of which relate to the three fundamental aspects of the Maid (enchantment, inception, expansion), the Mother (ripeness, fulfillment, stability) and the Crone (wisdom, retrenchment, repose). Every woman, and every Goddess-form, contains all three – both cyclically and simultaneously. No woman who fails to grasp it can understand herself; and without grasping it, no one can understand the Goddess.”²⁰

Connecting this experience to the Moon’s phases, Farrar refers to the concept of the Triple Goddess “as old as time” reflected in the relationship between lunar phases and menstruation that “touches on deep and mysterious aspects of the feminine principle, and of the Goddess herself.”²¹

¹⁸ Stewart Farrar and Janet Farrar, *A Witches’ Bible: The Complete Witches’ Handbooks* (London: R. Hale, 1997), Book 2, 62.

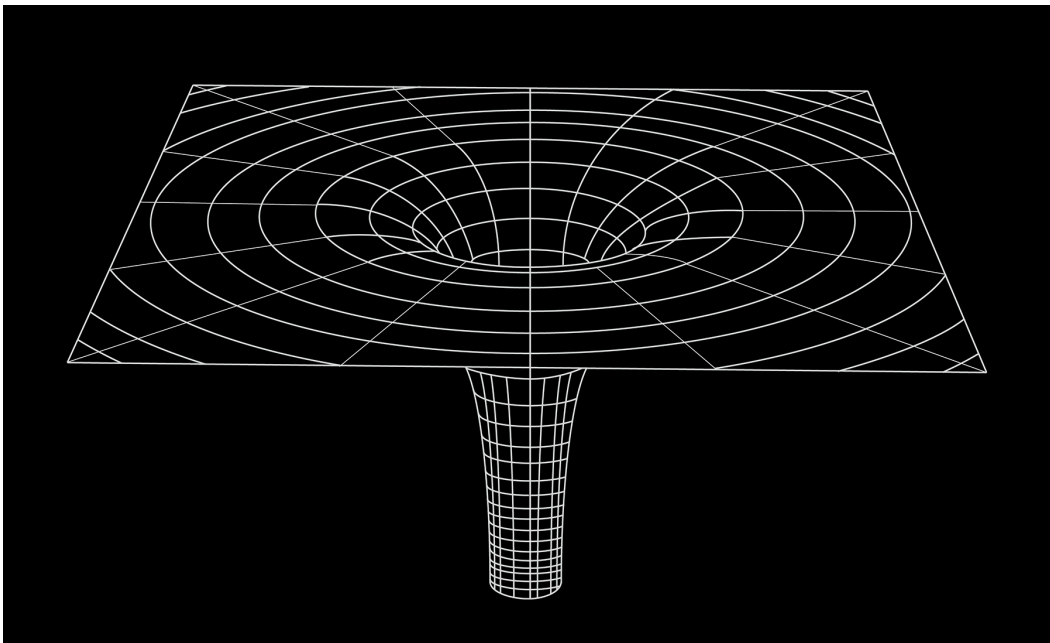
¹⁹ Stewart Farrar and Janet Farrar, *A Witches’ Bible: The Complete Witches’ Handbooks* (London: R. Hale, 1997), Book 2, 71. The Three Goddess Ritual is a ritual designed to honor the Goddess Brigid, but can be extended past Celtic paganism and manifests as ritual practice in a variety of pagan practices. The ritual revolves around three roles enacted by female practitioners and is important to understanding the unconscious connection between practitioners and the Triple Goddess, a step beyond the superficial understanding of the function of the Triad of Goddesses.

²⁰ Stewart Farrar and Janet Farrar, *A Witches’ Bible: The Complete Witches’ Handbooks* (London: R. Hale, 1997), Book 2, 72.

²¹ Stewart Farrar and Janet Farrar, *A Witches’ Bible: The Complete Witches’ Handbooks* (London: R. Hale, 1997), Book 2, 71.

The connection between the female experience and that of the Triple Goddess is innate; within each female-identifying body exists these three phases at once. Understanding of these three phases is the understanding of the cyclical nature of the female experience, and further the understanding of the Mother Goddess.

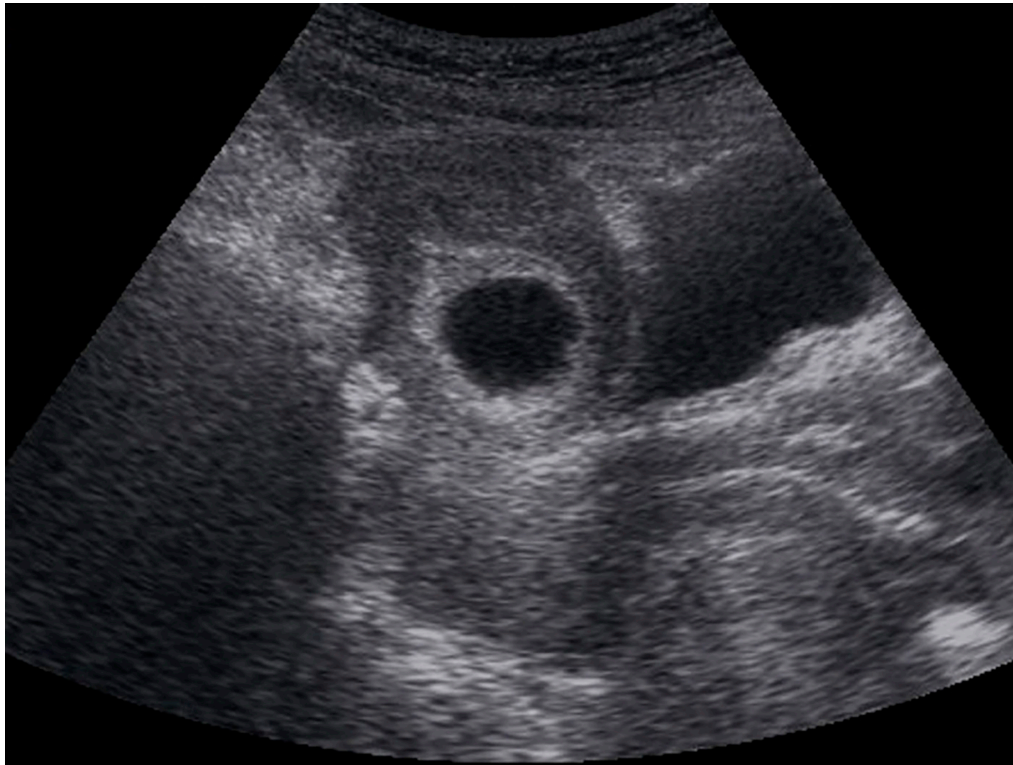
Theory: *The female uterus mimics the structure of the black hole, both in shape and in understanding within the scientific community.*



7. Elizabeth McGrady, *Structure of a body in a black hole*, Archival inkjet print, book spread (2020)

Examining the structure of the black hole, we see it as a rupture in a seemingly flat plane. As gravity pulls rays of light towards the black hole, the plane stretches

downwards in this figure, creating a funnel-like shape. As we examine the structure of a uterus, a similar arrangement is present.



8. Elizabeth McGrady, *Uterus*, Archival inkjet print, book spread (2020)

Three parallels are drawn – first, the malleability of both materials. The bend and pull of the light rays towards a black hole correspond with the flexibility of the uterus as the elastic walls growing to about 500 times its original size during pregnancy. Second, both structures contain analogous spaces. The physical space within a uterus where the fetus grows mirrors the space within the black hole created by the bending of light rays. Third, we can draw a direct physical comparison between the opening of the uterus and the opening of the black hole, as gravity pulls an entity within the spaces of these structures towards an entirely new world.

Further than the connection between the physical attributes of a black hole and the human uterus is the connection between the understanding of both objects in the scientific community. As previously mentioned, our scientific knowledge of the black hole is significantly circumstantial and observed from a great distance, applying our knowledge of physics to a manifestation with which we cannot physically interact. The female reproductive system has been explored scientifically in a much different way, yet resulting in a similar lack of understanding. Scientific experiments regarding the female uterus have been significantly affected by outside influences such as politics, cultural impositions, and stigma. Healthcare providers prescribe various hormonal birth control methods without a full understanding of its effect on the body.²² The female uterus is treated as a pawn in politics, not as a human organ. This attitude dramatically affects the scientific understanding of how the system operates, leaving harmful gaps in knowledge.

²² Clara Moskowitz, "Fertile Ground: The Long-Neglected Science of Female Reproductive Health." *Scientific American*. Published May 1, 2019. <https://www.scientificamerican.com/article/fertile-ground-the-long-neglected-science-of-female-reproductive-health/>.



9. Elizabeth McGrady, *Follicle*, Archival inkjet print, book spread (2019)

Theory: *The uterus functions as a being existing in a black hole.*

As previously stated, a being in a black hole exists on all planes of existence at once, in one form. Founded in the thought experiment of Schrodinger's Cat, the uterus exists in a similar state. As the uterus holds the potential for life within itself, as well as the possibility to deny the creation of such a life, it contains all possibilities of the future of the organ.

Theory: *The Host, containing the uterus, exists as an extension of the status of the organ, simultaneously as Maiden, Mother, and Crone. The Host exists and will continue to exist as her former, current, and future self, contained in one form.*

The connection between the female-identifying person and the Triple Goddess is analogous to the connection between the uterus and the black hole. The concept of a being existing in multiple states extends to each entity, across qualitative and intangible aspects. As the uterus contains all possible states of being and a being in a black hole exists in all possible universes, the female body contains spiritually within itself each element of the cyclical nature of female existence as denoted in the multiple facets of the Triple Goddess. Therefore, the female body, as the spiritual extension of the uterus, contains all futures and possibilities.

Extending this to the Host of the proposed mission, she exists as Maiden, Mother, and Crone within one being. The possibilities of the Host's future endeavors, specifically here the possibility of pregnancy, birth, and motherhood on Mars, are contained within a being that has not yet entered that mission. She contains all phases within her, no matter what phase she currently experiences in our specific position on the space-time continuum. There exists an internal slippage of time within this, a concurrent deep-rooted identity that is yet not grounded in one particular moment. The Host can be thought of as already having completed the mission, as past, present, and future simultaneously exist within her.



10. Elizabeth McGrady, *Host*, Archival inkjet print (2019)

V. Only My Retinas Will Burn

The settlement of Mars poses serious logistical questions that our current technology may not yet be advanced enough to solve. Mars has an atmosphere that is significantly thinner than Earth's, with gravity on the surface of the planet being less than 40% of Earth's gravity and less than 1% of the surface pressure. This fact, combined with the freezing temperatures on the planet, leads to an abundance of carbon dioxide that the atmosphere cannot filter out, which then freezes and results in dry ice. While most of the ice on Mars is carbon dioxide-based, there is evidence of water ice on the planet as well. Scientists theorize that the majority of Mars was once covered in water, as evidenced by the geological formations on the planet's surface. Large rivers, streams, and seas have left deep tracks in the soil and rock. Scientists have even postulated that Mars, at one time, appeared as a smaller version of Earth. However, this presence of water is not an indicator that human life would thrive on the planet. With both the relatively small amount of water and its current icy form, the water on Mars would not provide any palpable benefit to human settlement.²³

²³ C Bangs, *Living off the Land in Space: Green Roads to the Cosmos* (New York: Copernicus Springer, 2014), 22.



11. Elizabeth McGrady, *Retina (1 of 2)*, Archival inkjet print, book spread (2020)

The presence of ice on the planet can tell us that at one point, life may have been possible on the surface of Mars. A great deal of the Martian atmosphere consists of methane, a gas that is often “the byproduct of terrestrial biological processes.”²⁴ The presence of methane is an indicator of two significant developments regarding possible past or future life on the planet. First, the existence of methane in the atmosphere indicates to exobiologists, scientists who study the possibility of life on other planets, that there may be bacteria based life forms existing beneath Mars’ surface.²⁵ Second,

²⁴ C Bangs, *Living off the Land in Space: Green Roads to the Cosmos* (New York: Copernicus Springer, 2014), 23.

²⁵ C Bangs, *Living off the Land in Space: Green Roads to the Cosmos* (New York: Copernicus Springer, 2014), 23.

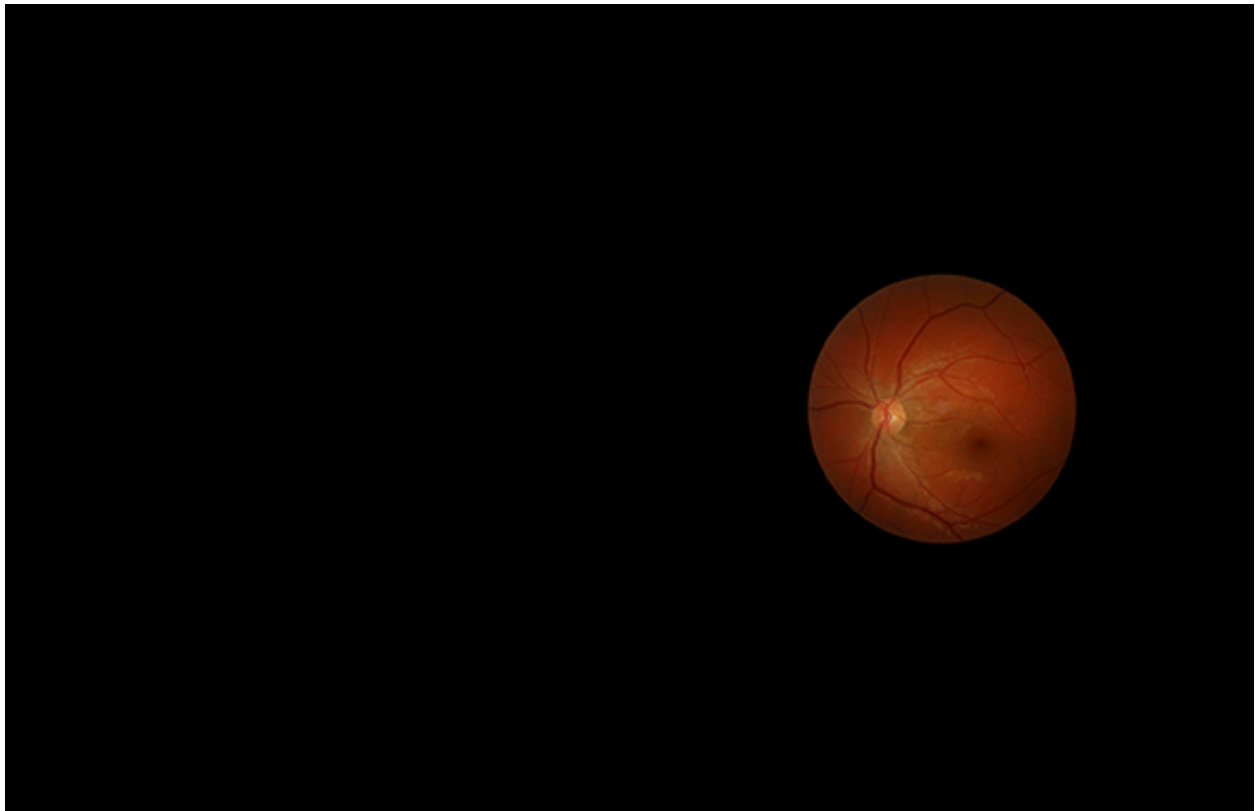
this methane abundance is a potential resource for a proposed Martian human settlement. Currently, the trip to Mars would last about six to nine months.²⁶ We cannot yet carry the required amount of fuel on a spacecraft to make the trip there and back. Martian-bound spacecraft sent into orbit are met with an additional rocket containing fuel once the craft leaves the Earth's atmosphere because the fuel for a one-way trip is still too heavy to leave our orbit with our current technology. However, the combination of methane and oxygen is perfect for rocket fuel, as there is no toxic byproduct of this chemical reaction. Harnessing the methane on Mars would require a small chemical plant and tanking station. The oxygen exists in a variety of sources, most notably from the large reserves of carbon dioxide on the planet as carbon dioxide contains oxygen.²⁷ The presence of these elements indicates that a return trip may be possible after some settlement on Mars, increasing the inhabitants' access to resources and our Earth-bound scientists' access to data from the planet's surface.

The inhospitable Martian landscape poses many scientific questions. However, we must further consider the effects both of long-term space travel and the condition of the planet's surface on the human body. The psychological effects of these states are not trivial for a human subject. The missions of Biosphere 2 in 1991 showed the general public that the human psyche goes under extreme duress when sequestered from society in such an abrupt way, that an obsession with food and longing for familiar

²⁶ C Bangs, *Living off the Land in Space: Green Roads to the Cosmos* (New York: Copernicus Springer, 2014), 22.

²⁷ C Bangs, *Living off the Land in Space: Green Roads to the Cosmos* (New York: Copernicus Springer, 2014), 188-189.

comforts of home become the subjects' main focus.²⁸ Previous space programs have seriously considered the type of psyche that is well suited for group space travel for missions to the Moon and the International Space Station. NASA currently uses computer simulations that pose frustrating situations to “gauge which candidates are best able to cope.”²⁹



12. Elizabeth McGrady, *Retina (2 of 2)*, Archival inkjet print, book spread (2020)

²⁸ Pat Duggins, *Trailblazing Mars: NASA's Next Giant Leap* (Gainesville, FL: University Press of Florida, 2017), 152-154.

²⁹ Pat Duggins, *Trailblazing Mars: NASA's Next Giant Leap* (Gainesville, FL: University Press of Florida, 2017), 147.

In addition to pressures put on the human psyche by such a mission, the physical effects of space travel and living in such a thin atmosphere are extreme. Being that the mission to Mars would be two months longer than any previous crewed missions to space, the undertaking would be a scientific experiment on the effects of a zero-gravity environment on the human body. We know that muscle atrophies in space, bone density lessens, and even the ligaments of the human retina degrade. The effects of this can be mitigated by a spacecraft that uses centrifugal force to create artificial gravity through a spinning motion. However, as these methods are untested regarding long-term space travel, the effects on the human body are not confirmed.³⁰ The next issue that arises is radiation exposure, which increases considerably in space and on a planet with an atmosphere as thin as that of Mars. We have seen the effects and significant health issues radiation causes on Earth-bound humans from nuclear power plant facilities and atomic weapons. There is no current technology to completely mitigate the effects of radiation, only ways to shield the human body from extreme exposure. SpaceX and Elon Musk have proposed spacecraft that shields passengers from radiation by insulating the vessel with a layer of water. Scientists have further theorized that in order to successfully negate the effects of radiation on humans residing on Mars, the settlements would have to exist almost entirely underground.³¹

The need to avoid harmful radiation on the planet's surface leads to several strategies of human settlement on Mars. Light conditions on the planet are not the same as on

³⁰ Stephen L. Petranek, *How We'll Live on Mars* (New York: TED, 2015), 28.

³¹ Stephen L. Petranek, *How We'll Live on Mars* (New York: TED, 2015), 29.

Earth, leading many scientists to theorize that plants would need to grow underground with artificial light to mimic the same farming conditions found on our planet.³²

Furthermore, there are strong arguments to be made for the terraforming of the Martian surface and atmosphere. Terraforming the planet involves creating a stronger atmosphere and increasing the amount of water on the planet's surface to create a more balanced, oxygen-rich environment similar to that of Earth. The entirely theoretical process is astronomically costly and takes an extraordinary amount of time.³³

Above all, our negotiation of these mitigating factors will provide a wealth of scientific data on the effect of space on the human body. This data opens up endless possibilities of humans successfully existing on planets further than Mars, outside the reaches of our solar system. Settlement on Mars is a stepping stone, a monumental breakthrough in human achievement, purely reliant on our species' ability to adapt to changing environments and problem solve. These problems arise from our current technological position, and there is no doubt that more will arise as this mission progresses. However, if we can learn anything from our existence on this planet, humans will find a way to survive.

³² Pat Duggins, *Trailblazing Mars: NASA's Next Giant Leap* (Gainesville, FL: University Press of Florida, 2017), 163.

³³ C Bangs, *Living off the Land in Space: Green Roads to the Cosmos* (New York: Copernicus Springer, 2014), 228.

VI. The Singularity

As previously discussed, a body traveling through a black hole reaches the point of no escape called the event horizon. This point is the brink of transformation, the point on the space-time continuum where a being is suspended before a drastic change. From this point forward, our understanding of physics breaks down. We are no longer able to predict the effect of this new environment on any object, whether that is a human body or a planetary body.

This point is the singularity. This term is not exclusive to black holes but originates from mathematics, and there are multiple applications of the concept. The most popular cultural use of the term singularity is the technological singularity, in which artificial intelligence becomes sentient and, therefore, able to continually improve upon itself using the technological discoveries of humans up until that point as its building blocks. Technological improvement after this event is entirely impossible to predict, as the discoveries made by sentient artificial intelligence would surpass our understanding of science.

In regards to a black hole, the singularity relies on the fact that the “curvature of space-time is infinite,” breaking down our understanding of science due to the simple facts that “all our theories of science are formulated on the assumption that space-time is smooth and nearly flat” and that “mathematics cannot really handle infinite numbers.”³⁴ Stephen

³⁴ Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), 49.

Hawking and Roger Penrose hypothesized that the singularity poses an interesting dilemma for our relationship to time, that “singularities would always lie entirely in the future or entirely in the past.”³⁵ There is no existing within a singularity because of the distinct shift of reality. There is only a before and after. This shift again highlights the importance of the event horizon, the space a body exists within before experiencing the singularity, as it refers to the brink before a significant, irreversible change.



13. Elizabeth McGrady, *The Singularity*, Archival inkjet print, book spread (2020)

³⁵ Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), 91.

The exiting of the uterus or the moment of birth can be considered a singularity considering the black hole and the uterus are intrinsically linked. At this point, a new life is created and, without knowing this new life fully, the system that was in place before the point of birth is forever changed and no longer operates the same way. There is no residing in a moment of birth. It exists as a point in time, and the only way to observe it is from before or after the event itself. Pregnancy then becomes the event horizon; the state a being exists in before a dimension-altering change.

This work considers the status of the being, the state of the mission, and the laws of physics as we know them up until the singularity of the birth of the first Martian. The birth of new life changes the lives of every human the new life encounters; the steady progression of life is briefly yet irrevocably interrupted. That event will inevitably change the way humans operate in the universe and it is a point from which there is no returning to a previous state of being.

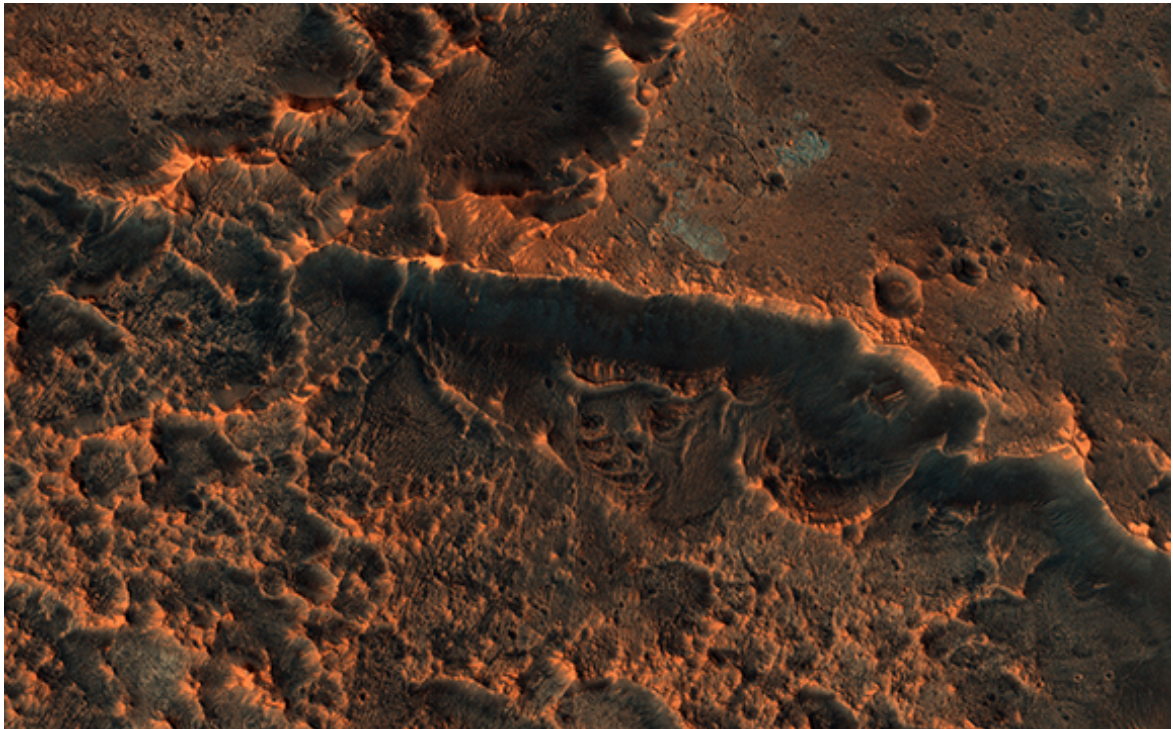
VII. Conclusion: The Martian Mother

The foundation of this work is the proposal of a crewed mission to Mars with the goal of human settlement and the consideration of the birth of the first Martian, centering myself as the first Martian Mother. The proposal will be shipped as a packet of information to titans of space exploration, existing beyond the traditional artistic community. Included is a booklet containing the written information above, a letter of introduction, and the visual material that also stands as an individual piece, printed in book form for this installment of the work.

The visual material includes photographs and diagrams, a mix of photographs I took as well as a new imagining of appropriated images from the Jet Propulsion Laboratory (JPL) and in vitro fertilization research. All images are presented in the same format and given the same attention in the book, conflating the different sources and activating a slippage between time and space. The Martian landscapes that I photographed are presented alongside the Martian landscapes from the JPL to activate a slippage of time and space, presenting the viewer with a narrative that is not rooted in one location.



14. Elizabeth McGrady, *Eggs*, Archival inkjet print, book spread (2020)



15. Jet Propulsion Laboratory – Caltech/University of Arizona, *The Changing Surface of Mars* (2019)

I am interested in the space between truth and fiction in photography, the telling of a narrative that borrows from both sides. I reference artists who tell historical narratives using falsified archival material, particularly artists such as Walid Raad, Cristina de Middel, Christian Patterson, and Joan Fontcuberta. Each of these artists either created or modified archival material to bolster their exploration of a specific story or scientific discovery in history. Werner Herzog succinctly describes this use of fiction in his theory of Ecstatic Truth. Herzog defines Ecstatic Truth as something to be uncovered, as “mysterious and elusive” that “can be reached only through fabrication and imagination and stylization.”³⁶ Through this, Herzog suggests that there is a truth, somehow deeper than what we recognize as truth, uncovered through the careful deployment of fiction.

³⁶ Werner Herzog, “On the Absolute, the Sublime, and Ecstatic Truth,” trans. Moira Weigel, Arion: College of Arts and Sciences (Boston University), accessed February 9, 2020, <https://www.bu.edu/arion/on-the-absolute-the-sublime-and-ecstatic-truth/>



16. Elizabeth McGrady, *Nili Fossae*, Archival inkjet print, book spread (2020)

In a similar motion, I use archival material and new photographs to explore a future narrative and create an environment in which the proposed mission is possible. The work achieves this through the deployment of aesthetic and structural qualities inspired by the work of psychedelic comic book writers and artists from the 1960s and 1970s, particularly the French comics centered around the character Lone Sloane created by cartoonist Philippe Druillet. In this, Druillet employs a baroque yet hard science fiction style ahead of its time. With clear influences of M.C. Escher and the dark storytelling of H.P. Lovecraft, the main character travels through dimensions and subverts the linear

storytelling so typical of comics. The structure of the book follows a similar progression, additionally drawing upon the heavy use of texture and color to create a visceral experience with the works on paper.



17. Philippe Druillet, The 6 Journeys of Loane Sloane, Page 14 (1966)

Martian Mother also examines the relationship of the female body to land, including photographs of human-like forms inscribed within the landscape and self-portraits as future imaginings of myself as the Martian Mother. These echoes in visual form reference Lucy Lippard's *Overlay* and the idea that "women can, and do, identify the forms of our own bodies with the undulations of the earth—the hills and sacred mountains which were the first gardens and the first temples."³⁷ What relationship will the female body have to the land of Mars? If we think of earth in the expanded definition that exists beyond our own planet, in a way that encompasses all soil, rock, and ground, then women are as inherently connected to the Martian landscape as the landscape of Earth. Artists such as Carolee Schneemann and Ana Mendieta are recalled in the imagining of the female form. Mendieta found her human form within the natural landscape, creating the likeness of her figure in soil, flowers, sky, fire, and ash. In Schneemann's performance piece titled *Eye Body*, having snakes crawl over her nude body in reference to the snake as a symbol of the goddess, fertility, and the female form bridges the spiritual and the literal in reference to the female body. The photographs contained within the Martian landscape of this work address those questions by juxtaposing the body and the rock, drawing parallels between Martian forms and flesh.

³⁷ Lucy Rowland Lippard, *Overlay* (New York: Pantheon Books, 1983), 42.



18. Carolee Schneemann, *Eye Body: 36 Transformative Actions for Camera*, photograph from performance by Erró (1963)



19. Ana Mendieta, *Untitled: Silueta Series*, Gelatin silver print (1978)



20. Elizabeth McGrady, *Martian Mother*, Archival inkjet print (2020)

Centered around the parallel between the human body and nature, the book visually extends that parallel to the connection between the uterus and the black hole. This drawn parallel takes the form of scientific diagrams interspersed with mythological and visceral landscapes. These diagrams provide an entry point, or rather an exit point, between the world of art and the world of science. The work acts as a middle ground, conflating art, science, and religion, set in the magic of space. This slippage is echoed in the physical manifestation of the work, as the objects in the packet do not reside solely in a recognizable category but bridge gaps between genres.

What is born in this proposal for birth is a new genre, one that treats mythology as hard scientific fact, spirituality as inherent in every being, and scientific data as a form of magic. There is arguably nothing more magical than the imagining of worlds beyond our own, whether that be a world on the other side of a black hole, a world where three benevolent goddesses care for our universe, or a world in which a new futuristic society on another planet upsets the oppressive structures of this one.

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