An Art History of Mars

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Ilana Halperin's "mineral biography" is often expressed as a series of milestone moments or points of contact.[1] These include the deeply personal encounter of holding the Allende meteorite, one of the oldest known objects in the solar system, in her hands.[2] Echoing Carl Sagan's famous sentiment that "we are made of star-stuff," Helen Gordon has recently written: "we may very well all be the descendants of meteorites."[3] There is both a literal and a poetic implication of these ideas for Halperin's art.

In recent years, the artist has turned her inquisitive eye towards planetary geology, specifically the alluring science behind the red planet Mars as a planetary sibling. This turn has surprised the artist herself, having long positioned her practice in the non-abstract ground beneath our feet.[4] Collective activity with current scientific research (Cousins) has guided Halperin towards making a new body of artworks across media (text, watercolour, printmaking and photography). This artistic engagement shows that Mars is no longer as remote and distant a place as previously felt. Moreover, Halperin's sensitive handling fosters urgent ethical questions around geo-heritage and the rights of other planets at a pivotal moment in technological and exploration history.[5] Does the wherewithal give governments and private companies the right to land hardware, or even astronauts, on Mars? Can a non-extractive means of engagement, using sites here on Earth equip us to ask better questions and form different ambitions? What does it mean to make a portrait of Mars? These are questions easily applied to the environmental wellbeing of our home planet, locating a likeness or common ground. This essay will contextualise Halperin's *Anatomy of Mars* cycle (2023-25) by providing a brief art history of our cosmic sibling through its three key geological epochs and their chemically-induced colour palettes: the familiar red, oxidised and inhospitable Amazonian (2.9 billion years ago to present), the sulphurous 'yellow' Hesperian (~3.7 – 2.9 billion years ago), and the young, almost Earth-like, 'blue' Noachian (4.1 – ~3.7 billion years ago). These ages capture major periods of change on Mars as it evolves through its birth 4.5

billion years ago, determined through the process of "crater counting" – using the density of certain sized impact craters that scar the surface to determine a geological age, calibrated to absolute radiometric dates measured from Earth's own Moon.[6]

Red Amazonian

Mars, our second nearest planetary neighbour after Venus, has long been associated with masculinity via Ares, the god of war. This gendering of Mars is often compounded with the "aggressive" connotations of its surface colour palette of rusty, blood-red, oxidized iron. "Cosmic art" to date has also tended to be the purview of men such as the alluring space-scapes of Chesley Bonestell, Luděk Pešek or the Redon-like fantasies of Alvim Corrêa. While highly imaginative, much of this output conforms to sci-fi visual narratives and later as the conceptual design for large-scale cinematic conquests and matte paintings. From Holst's rousing orchestra movement, *The Planets* (1914-17), to H. G. Wells's novel *The War of the Worlds* (1898), authoritative voices and male-dominated rhetoric have undeniably driven the cultural history of Mars to date. Such "Martian mania" was conveniently shored up for a time by Percival Lowell (1906) and Giovanni Schiaparelli's (1877) telescopic observations of "canali" on Mars – the mistaken but compelling architectural suggestion of intelligent life.[7] While men fixated on these whims and illusions, it seems telling that so few to date have looked at the red planet and imagined queer-feminine attributes instead.

Halperin's approach is tactile and microcosmic, a revision of what "touching Mars" (and so-called "mother Earth") might mean.[8] Her *Mars Reds* (2024-) sense the complexity of its distinctive pigment. She has long been interested in the non-illustrative, intuitive qualities of art-making, taught as she was on the legacies of a minimal and conceptual approach care of Sam Ainsley's "red feminism" on the MFA programme at The Glasgow School of Art in the late 1990s.

Intriguingly, much of Halperin's critical foundations occurred at the dawn of the mid-twentieth century Space Age. The history of Mars exploration overlaps with the practices of Halperin's artistic touchstones such as Isamu Noguchi and Robert Smithson. French conceptual artist, Marcel Duchamp, made fun of being called "far out," an American

slang description for his paradigm-shifting readymade.[9] Noguchi's unrealised proposal, *Sculpture to be Seen from Mars* (1947), shows that the Japanese avant-garde already "saw the earth as a sculpture" long before the Western earthworks of the 1960s and 70s.[10] Smithson would later note in a didactic drawing, *Three Works in Metal and Plastic* (1964), that: "it has been reported that the Mariner camera showed Mars to have surfaces like mirrors," evidencing an engagement with space exploration by one of America's most notorious environmental artists.[11] Smithson's celebrated idea of the "non-site," an ex-situ sample of a landmass brought back to the gallery, finds a fitting parallel with a scientific method known as the "analogue" where sites on Earth (such as Icelandic hot springs and Orcadian cliff edges) mimic the conditions or terrains that might be found on Mars (more on which later).[12] Microbiologist Wolf Vladimir Vishniac was alert to this idea before his untimely death in 1973 (but his resulting "wolf trap" sample-return experiments are yet to be realised).[13]

The Mariner 4 flyby photograph (July 1965) is an important artefact in this history for Halperin. As a prelude to her art, it provides an alternative way of seeing through a layering of artistic media. This was the first digitally achieved, television close-up of Mars completed back in the Jet Propulsion Lab by experimental, analogue means. As the numerical data was transmitted to Earth from the Mariner 4 camera, it was printed on teletypes, cut into strips, then hand-coloured with crayons to produce the distinctive profile of the red planet's surface. Like existing Mars art, this too could be seen as a creative reinterpretation rather than an exacting or faithful rendition. The appealing rusticity of this paint-by-numbers technique and tangibility of this image's creation, with its black registration marks, earthy ochres, creamy yolks and spicy orange tones, hint at the necessity of human touch and capacity for description amidst high-tech ingenuity.

A further synchroneity between art history and Mars exploration with a political edge occurred with the constructivist design of the Mars flag (1984) by NASA administrator, Thomas O. Paine.[14] The design is highly reminiscent of the revolutionary phase of abstract constructivist visual language from Russia, such as El Lissitzky's *Beat the Whites with the Red Wedge* (1919). The flag became a potent symbol of the Mars Underground – a student movement founded at the University of Colardo, who were interested in terraforming, and

committed to the future of Mars exploration after the anti-climax of the Viking Mission (1976), disappointing for having found no explicit signs of life or even organic compounds in the Martian soil chemistry. The flag was intended to herald a new generation of Martian inquiry with primary colours and the astronomical symbol of circle and arrow pointing the way towards the stars. During the Cold War, the flag's utopian symbolism and left-leaning "red" associations could not have escaped notice as presenting a grassroots challenge to the status quo. In our current era of billionaire space travel, Halperin's quiet poetics provide much needed critical resistance to such frontier languages and colonial tendencies.

Yellow Hesperian

Mars is a changing planet, and its lack of global tectonic activity means its geology has evolved very differently from that on Earth. In addition to sensing the colour palette, the resulting topographic textures and morphology of Mars have become profoundly important to Halperin's inner landscapes. There is a physicality to distant Mars that seems to invite intimate caresses. Rather than the plain desolation imaged in the mid 1970s, instead "something has happened here!" The artist uttered this exclamation while immersed in the D'Arcy Thompson Simulator Centre at the University of St Andrews. Here, she was able to virtually witness Mars's chaos terrains, inspecting its numerous craters and oversized chasms that crisscross, enmesh and intermingle as the result of overlapping geological and fluvial processes. Halperin was profoundly moved by this experience: "I feel…unexpectantly emotional. There are tears in my eyes. I didn't expect to find them there!"[15]

While scientists draw a likeness between Martian topography and analogue terrains on Earth, Halperin leans towards anatomical metaphors.[16] Bodily analogies abound – from the bulging orifice of Olympus Mons (the largest shield volcano in the solar system) to the cracked epidermis of Valles Marineris (a gigantic abyss many times longer and deeper than our own Grand Canyon). These spectacular, exaggerated features began their formation during the Hesperian. Meanwhile on a global scale, Mars quietly dried up and gradually sequestered its remaining water into its frozen cryosphere. Sulphate salts precipitated into existence, locking away yellow volcanic sulphur that had accumulated

into Mars's global atmosphere and surface waters. In her text-based works, *An Art History of Mars* (2024), Halperin speaks of soaking her aching bones in Epsom salt – a magnesium sulphate salt common to Hesperian Mars, soaking its own anatomical features.

Thanks to the rovers and landers (or "robotic geologists") that have successfully touched down on Mars, planetary geologists are learning more about the complex history, mineralogy, and changing environments of the Martian surface. These rovers are the "eyes" and "fingers" of Mars, and some have names which mimic Halperin's approach: Curiosity, Perseverance, Opportunity and Spirit. Each of these rovers, two of which are presently active (Curiosity since 2013; Perseverance since 2022), have brought humanity as close to Mars as technologically possible, with virtual immersion onto the surface now enabling artists like Halperin to lend her human poetics to Mars's geology. We now know that Mars has been a dynamic planet mirroring many of the processes we observe on Earth, which themselves inform our interpretations of Martian features. The NASA Mars Exploration Rover (MER) Spirit uncovered an area of ancient volcanism and hydrothermal silica, while the MER Opportunity found hematite rich spherules and sediments cemented by sulphate rich groundwaters. As always, science uses an Earth-based analogy, in this case "blueberries," something familiar, to describe what we are seeing on an extraterrestrial locale.[17]

Later, NASA's Curiosity revealed ancient Noachian sediments deposited in river channels and lake beds, and grey clay-rich mudstones hiding just a few centimetres beneath the red oxidised exterior. Mars is not just red, even today. Finally, NASA Perseverance has been busily drilling and caching Martian rocks in and around a late Noachian/early Hesperian delta deposit, leaving behind geological treasures with the hope of returning these to Earth one day.

In the alabaster and marble sculptures *They Are Our Eyes and Fingers* (2025), Halperin's mark-making traces the possibility of otherworldly beings and evidence of biological activity. Each presents a miniature chaos terrain of multiple happenings and prepositions: on, under and within an infinity of unique landscapes. These marks are

infilled by Halperin with mustard-coloured, natural ochre from Ness Point in Orkney (an analogue for Mars), and tawny, umber soil from the farm once belonging to James Hutton - the 'Father of modern geology', conjuring another imaginative, recursive link with Earth, universal matter and the tangibility of ideas.

Blue Noachian

There is abundant evidence that Mars was once a much wetter environment than the icy, dry exterior we see today. The Noachian era takes its name from Genesis, namely Noah whose Ark saved two of each animal during the biblical deluge. Such fluvial thinking has been key to a queer-feminist approach too – suggestive of a leaky body politics that flows or fudges classification or containment and forges alternative channels.[18]

Interest in a watery Mars was further sparked by the politically-timed reveal of ALH84001 in 1997, a repeatedly shocked and hydrothermally altered, ultramafic Martian meteorite found in 1984 by geologist Roberta Score in the Allan Hills region of Antarctica, and identified at the time as containing nanoscopic, fossilised Martian lifeforms.[19] While these "nanofossils" have since been widely refuted with improved analytical technologies, it spearheaded our ongoing fascination with understanding the past habitability of Mars, and the continued search for ancient life with better tools at our disposal.[20] ALH08001, and the small number of other Martian meteorites, function as marvellous time capsules – pieces of Mars chipped off the old block and making their long journey through the solar system to something tangible we can collect, grasp and study.

Halperin's *We are all extremophiles* (2025) uses the Earth analogue of the hot springs in Iceland to create a character study of these possible beings. These terrestrial hydrothermal streams, where the temperature, pH, and water chemistry are just right, permit single-celled extremophilic microorganisms to flourish into hairy macroscopic masses at the fringes of existence where no other forms of life can survive. This is life at the level of metabolism. These provide a living analogue to plausible biology on early Noachian Mars, where similar hydrothermal steams would have abound. Similarly,

ancient lake habitats on Earth, now immortalised as sedimentary strata in Orkney and Torridon in Scotland, provide another analogue for early Mars locales. These lakes supported the thriving growth of photosynthetic microbial mats at their shallow margins – dense, leathery communities of microorganisms, that eventually decorate the sedimentary strata as wrinkly fossil stromatolites. These Earth rocks furnish scientists with knowledge of how this lithological capture of biological material imparts a unique chemistry on the host sediment, something that can also be detected on Mars. Halperin's photograph, *Ness Point Stromatolite* (*For John Flett Brown*, 2023), bears this thought – a fitting memorial to a recently lost friend.

Clay minerals on Noachian Mars evidence long-lived liquid water that once flowed on its young surface. These slowly accumulated at the distal edges of deltas, on the floors of lakes, and as the alteration products of hydrothermally effected crust.[21] Sagan describes Martian clay as "a catalyst to accelerate, in the absence of life, chemical reactions which resemble the activities of life."[22] Today, this clay-rich strata not only attests to a watery past but also serves as an ideal mineralogical archive for the capture and protection of organic material – biogenic or otherwise – for billions of years.[23] Clay has parallel artistic utilities and, in Halperin's view, a malleable memory too, echoing its ability to capture glimmers of past biology. [24]

"Why on earth think about how Mars and I are alike, are different?"
(Halperin, 2025)

Through *An Anatomy of Mars*, Halperin holds up a mirror to a red, yellow and blue planet, bringing a human intimacy to geological forms and fleeting microbiological existence. Where science uncovers the factuality of Mars – its planetary processes, evolving chemistry and mineralogy, and potentially the future discovery of ancient fossil life – artistic interpretations introduce a deeper, cultural and felt purpose to this knowledge. Science typically aims to remove any emotive influence from the scientific method of hypothesis, data collection and interpretation. Artistic rendering of the knowledge and concepts borne from this cycle allow the human element to step back in and reclaim the "why" and the "what" to create wholly new non-scientific interpretations of place and process. These contribute the missing edges to our ongoing understanding of other

worlds, and their relationship to our own. Through the creation of new artworks, Halperin reveals the multifaceted utility of an analogue site – simultaneously a scientific reference for Martian processes and a site of material artistic exploration. Together, this utility contributes to the geoheritage of such sites, giving them a wider purpose and meaning beyond simply being the ground we stand on. As we look to future Mars surface exploration, the questions again turn to the possibility of life once occupying its Earth-like habitats. In 2028, the European Space Agency will launch its flagship Mars rover Rosalind Franklin, named after the pioneering scientist who was pivotal in revealing the structure of DNA – the genetic code for all life on Earth. Rosalind Franklin will land in an ancient area of Mars – Oxia Planum – and will look for organic molecules sandwiched between sheet-like Noachian clay minerals.[25] While we can use Mars as a launch pad towards the stars, Halperin flags its ethical aesthetics, encouraging an incremental, thoughtful approach. We end with a guiding principle from 'The Declaration of the Rights of the Memory of the Earth' (1991) which we might extend to our planetary sibling: 'Our history and the history of the Earth are closely linked. Its origins are our origins, its history is our history and its future will be our future.'[26]

Notes

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[1] Ilana Halperin interviewed by Lisa Le Feuvre, *Ilana Halperin: Felt Events*, ed. Catriona McAra (London: Strange Attractor Press, 2022), 104.

[2] Sara Barnes and Andrew Patrizio eds, *Physical Geology: A Field Guide to Body Mineralogy and Other New Landmass* (Berlin: Medizinhistorisches Museum der Charité, 2010), 22.

[3] Helen Gordon, *The Meteorites: Encounters with Outer Space and Deep Time* (London: Profile Books, 2025), 83. See also, Carl Sagan, *The Cosmic Connection: An Extraterrestrial Perspective*, ed. Jerome Angel (Cambridge: Cambridge University Press, [1973] 2000), 190.

[4] Ilana Halperin interviewed by Catriona McAra (July 2025). Unpublished.

[5] 'Declaration of the Rights of the Memory of the Earth' (Digne-les-Bains, 1991).

[6] W. K. Hartmann and G. Neukum, 'Cratering chronology and the evolution of Mars,' *Space Science Reviews*, *96*:1 (2001), 165-194.

[7] Carl Sagan, 'Episode 5: Blues for a Red Planet,' *Cosmos* (PBS, 1980): https://www.youtube.com/watch?v=bqFe-YksnuU&ab_channel=TomKNJ Accessed 15 August 2025

[8] Angela Carter, *The Sadeian Woman* (London: Virago [1979] 2006), 6.

[9] Marcel Duchamp cited in Ecke Bonk, *Joseph Cornell/Marcel Duchamp…in resonance* (Berlin and Stuttgart: Hatje Cantz, 1998), 70.

[10] Amy Lyford, *Isamu Noguchi's Modernism: Negotiating Race, Labor, and Nation, 1930-1950* (Oakland, CA.: University of California Press, 2013), 13; 41.

[11] Robert Smithson cited in Eugenie Tsai and Cornelia Butler, *Robert Smithson* (Los Angeles: Museum of Contemporary Art, 2004), 214.

[12] Toni Galloway *et al*. 'Biological nitrogen cycling within terrestrial hot springs: A Mars analogue system,' *Earth and Planetary Science Letters* (May 2025): https://doi.org/10.1016/j.epsl.2025.119461 Accessed 18 August 2025

[13] Like Smithson's tragic aircraft accident, Wolf Vishniac perished through a hiking expedition the same year as Halperin was born, 1973.
[14] Andrew Chaikin, *A Passion for Mars: Intrepid Explorers of the Red Planet* (New York: Abrams, 2008),144.
[15] Ilana Halperin in 'Field Notes From Mars,' *Open Country* (BBC Radio4, 2024): https://www.bbc.co.uk/sounds/play/m001xvmk Accessed 18 August 2025 Thanks to Rose Ferraby and Ruth Sanderson.
[16] Carl Sagan, *Cosmos: The Story of Cosmic Evolution, Science and Civilisation* (London, Abacus [1980] 1995), 141.
[17] Chaikin, 246.
[18] Amelia Jones, *Irrational Modernism: A Neurasthenic History of New York Dada* (Cambridge, Massachusetts: MIT Press, 2004), 32.
[19] Dave McKay *et al* 'Search for past life on Mars: Possible relic biogenic activity in Martian meteorite ALH84001,' *Science*, 273 (1996): 924-930. See also, Ezzy Pearson, *Robots in Space: The Secret Lives of our Planetary Explorers* (Cheltenham: The History Press, 2020), 166.
[20] Harry Y. McSween, 'The Search for Biosignatures in Martian Meteorite Allan Hills 84001,' *Biosignatures for Astrobiology: Advances in Astrobiology and Biogeophysics*, ed. B. Cavalazzi and F. Westall (2019): https://doi.org/10.1007/978-3-319-96175-0_8 Accessed 20 August 2025
[21] Bethany L. Ehlmann *et al*, 'Geochemical consequences of widespread clay mineral formation in Mars' ancient crust,' *Space Science Reviews* 174:1(2013): 329-364.
[22] Sagan, 'Episode 5.'
[23] Bethany L. Ehlmann *et al*, 'Clay minerals in delta deposits and organic preservation potential on Mars,' *Nature Geoscience* 1:6 (2008): 355-358.
[24] Ilana Halperin in conversation with Claire Cousins and Catriona McAra (Hveragerði: Listasafn Árnesinga, July 2025).
[25] Cathy Quantin-Nataf *et al*, 'Oxia Planum: The landing site for the ExoMars "Rosalind Franklin" rover mission: Geological context and prelanding interpretation,' *Astrobiology*, 21:3 (2021): 345-366.
[26] The first international symposium on the conservation of our geological heritage took place in 1991 in Digne-les-Bains under the patronage of UNESCO. It resulted in the International Declaration of the Rights of the Memory of the Earth being adopted on the 13th of June 1991.