

2017-08-21

This Excited Surface

Grant, Jane

<http://hdl.handle.net/10026.1/11353>

All content in PEARL is protected by copyright law. Author manuscripts are made available in accordance with publisher policies. Please cite only the published version using the details provided on the item record or document. In the absence of an open licence (e.g. Creative Commons), permissions for further reuse of content should be sought from the publisher or author.

The Skin of the World: Desire as interaction in the sonic artwork *This Excited Surface*

Jane Grant jane.grant@plymouth.ac.uk
University of Plymouth, Plymouth, UK

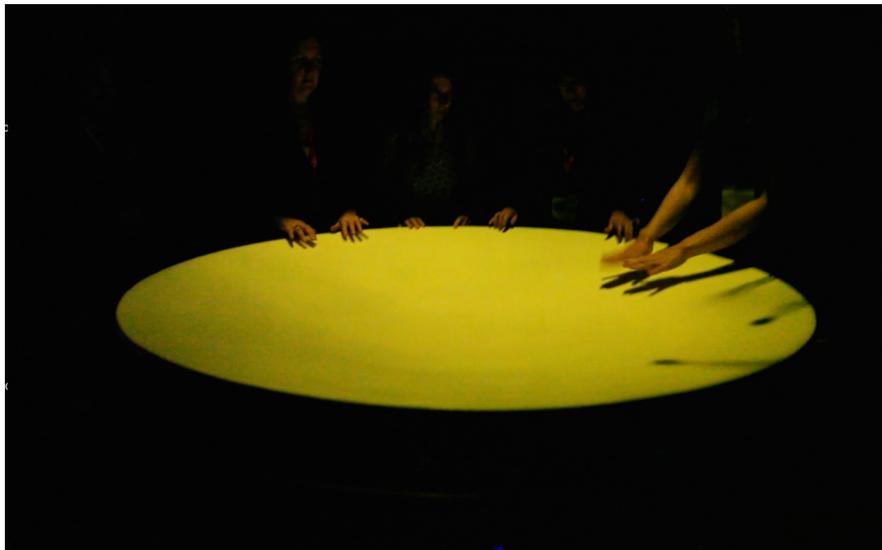


Photo: Jane Grant

Grant, J. 2018. The Skin of the World: Desire as interaction in the sonic artwork *This Excited Surface*. In: Proceedings of the 5th Biennial Transdisciplinary Imaging Conference, TI2018, 18-20 April 2018, Edinburgh, UK. DOI: 10.6084/m9.figshare.6104744.



The Skin of the World: Desire as interaction in the sonic artwork *This Excited Surface*.

Jane Grant

Plymouth University
Drake Circus
Plymouth
UK PL4 8AA
jane.grant@plymouth.ac.uk

Abstract

This Excited Surface is a context-specific artwork sited in camera obscuras. The work combines sounds from our ionosphere with a spoken narrative that interweaves astronomical histories, solar physics and desire with a sonification of the sun's activity on the outer edges of our atmosphere. This article gives a description of the artwork and extends the context of this research through a discussion about touch via Juhani Pallasmaa and Karen Barad and about desire and longing. I propose the idea of the ionosphere as the skin of the world, a dynamic interface between the sun and the earth and liken this to interactions at the proposed boundaries of our own bodies. This attunement with other systems or beings affords an engagement with these other worlds, whether terrestrial or cosmological and an entanglement with other beings and things.

Author Keywords

Solar physics; desire; site-specific; architecture; the cave; skin of the world, sound, senses.

Introduction

This Excited Surface

Before entering the building, participants can already hear a deep bass sound, they are led into a dark space where the disk of the camera obscura glows yellow like the sun looking up from the earth, this is achieved by inserting yellow gels in the lens above.

As their eyes adjust in the darkness, participants can hear a deep bass sound coming from a speaker under the dish of the obscura and the fizzing, cracking sound of the ionosphere via four wall-mounted speakers and later, when they have adjusted to the darkness, a voice narrates an abstract tale of longing, optics and darkened spaces. There are six contact mics attached to the underneath of the dish which allow the participants to interact with the work using movement and touch. This allows another layer of sound to emerge, indiscernible fragments of a female voice, brought into being through touch.

When *This Excited Surface* was shown in Plymouth in 2017, participants tended to stand in a circle around the deep yellow disc, whilst listening to the sounds and narrative; there is an intimacy in a circle where one's gaze might alight on another person. The interactive element is not obvious so that the participants can come across it as they move towards the dish, a process of discovery and play.

For some time I have been developing narratives in the form of articles, chapters and papers that aim to build a language between astronomies and speculative creative writing. This work draws on analogies of gravitational or magnetic attraction and repulsion to those of human desires. Using touch as an interactive element draws our attention to the desirous aspect of the narration. The intention of the work is to place human desire at the core

of the sun's interactions with our atmosphere, desires that are cyclical, echoing the ionosphere's interaction with the sun. The work was exhibited for a short time in 2017 as part of *BalanceUnbalance* an international symposium and will exhibited as part of an international exhibition, *The Atlantic Project* in 2018.

The ionosphere

Our earth is enveloped by the atmosphere, a wet, dry, gaseous, mutable system. The ionosphere is an invisible sphere of electrons and electrically charged molecules and atoms (ions) that form one of the outer layers of the atmosphere. The ionosphere is coupled with the magnetosphere and lies at the edges of the atmosphere where it protects the earth from the radiation of the sun although is also created largely from the action of this radiation. Changes in the ionosphere are usually caused by the solar wind, a stream of electrically charged particles that interfere both with the ionosphere and the magnetosphere. The ionosphere adapts and changes during the 24-hour cycle of the each earth day, the area facing the sun is lengthened whilst on the side facing away from the sun is diminished only to be restored by the sun's radiative action.

The ionosphere is never static, but is a fluctuating surface or skin around the earth. The ionosphere lies in the space between the earth and the sun, but belongs to neither entirely as it is a creation of the action of the sun and the rotation of the earth's core. Gravitationally drawn around the earth, the ionosphere inhabits a place between the heat of our atmosphere and the cold of space although it is stimulated by other events; solar storms and sub-storms in the ionospheric and magnetospheric system. The ionosphere is an interface between these two celestial bodies, it is a gatekeeper of radiation, and the skin of the world. (4)



Installation still, *This Excited Surface*, August, 2017. Photo credit: Jane Grant

The cave

'Entering the cave means crossing a border between the worlds of the familiar and the unknown.' (28)

The cave is often thought of as our early ancestors' first dwelling place, a dark interior carved by geological elements shaping out a rudimentary home. Crossing from the world of light into the world of shadows, inhabiting the interior of the cave there is a diminishing of the need for sight in favour of other more intimate senses.

In Susan Sontag's (24) retelling of *The Allegory of the Cave* by Plato, shadows of the world outside, projected onto the wall of the cave by means of fire are confused for the 'real'. Sontag argues that through photographing the world we hold on to these fractured representations of the real because we cannot or choose not to grasp the fluidity of reality, the photograph's fixedness and fragmentation of the real standing in for the fluctuating world of complex sensory experiences.

One might think of the camera obscura as a cave, a

darkened space that allows us to observe the outside world via a lens or pinhole. The projection of the moving image onto the dish is a representation of the real, which affords an image of the world whilst cloistered in its darkened interior. The camera obscura is an architectural space built for unobserved viewing. And in channeling light through the lens the circular viewing dish of the camera obscura becomes a virtual space, a miniature virtual world and silent moving image that cannot be fixed. Early astronomers used a bowl of oil to look at the sun, using its dark doppelgänger to examine the sun's activities, and perhaps later these fleeting celestial phenomena were gazed upon in early obscuras. These dark environments were important to the discovery of perspective. As Oliver Grau discusses, obscuras were an innovation in the discovery of perspective and an important precondition for its development was a further stage in the process of individualizing the observer as using the obscura required isolation within a darkened space.

This isolated situation of the observer in the camera obscura, as Crary expresses it "provides a vantage point into the world analogous to the eye of God." (8)

Here I would like to leave behind the predominantly visual aspect of the camera obscura and turn towards the more haptic and entangled senses, senses of intimacy rather than distance of sight. In darkened spaces our other senses become more acute; hearing, touch, the proximity of other's bodies coalesce as a matrix of sensory cues, creating an atmosphere of sensation rather than the distinctions and distances of sight.

The philosopher Brian Massumi writes:

'Vision may ostensibly predominate but it never occurs alone. Every attentive activity occurs in a synesthetic field of sensation that implicates all sense modalities in incipient

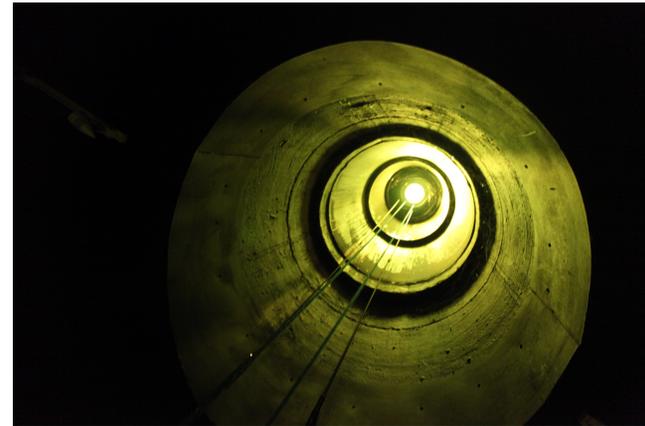
perception, and is itself implicated in self-referential action.’ (11)

Massumi goes on to describe this synesthesia as a kind of haunting gathered around a predominant perception that is ‘only vaguely felt, or side perceived, like a fringe around formed perceptions and reflections.’ (12)

It is these entangled, haunted senses or perceptions that the artwork *This Excited Surface* seeks to evoke. I chose to point the lens toward the sky so that there was an absence of image in the dish, to turn the camera obscura into an imageless space where we encounter a glowing yellow sun beneath the earth and although we gaze at this sun our senses are more attuned to hearing, to proximity and to touch.

‘Our sensory experience of the world originates in the interior sensation of the mouth, and the world tends to return to its oral origin. The most archaic origin of architectural space is in the cavity of the mouth.’ (19)

The architect and writer Juhani Pallasmaa’s assertion that the interior of the mouth is our primary sensory exploration of space, via touch and movement, proposes the idea of the mouth as a cave or dwelling space. In the pre mirror stage, Jacques Lacan describes the early infant’s sense of the world as a chaos of entangled senses before vision develops fully enough into the individuation of seeing. (10)



Installation still, *This Excited Surface*, August, 2017. Photo credit: Jane Grant

In *This Excited Surface* the dark cavity of the camera obscura is a cave likened to the interior of the mouth, and as Pallasmaa would have it the origins of our senses.

‘In memorable experiences of architecture, space, matter and time fuse into one singular dimension, into the basic substance of being, that penetrates our consciousness. We identify ourselves with this space, this place, this moment, and these dimensions become ingredients of our very existence. Architecture is the art of reconciliation between ourselves and the world, and this mediation takes place through the senses.’ (20)

This coalescing of site, sound and narration in *This Excited Surface* is an extension of both my artwork and writing. I fused the narration and sonic environment with the aim of siting our bodies, our senses, both aural and haptic with human desires, within the phenomena of the ionosphere.

This Excited Surface and other examples of my work (*Soft Moon* (5) and *Orbit* (6)) and writing draw on my experience of the matter of things, the attraction or

repulsion of materials, the experience of electro-magnetism and gravity. Although most of the artworks are not physical in a material sense they often describe the invisible, the ephemeral, the untouchable. These abstract imaginary worlds are formed with sound, narrative and/or place and aim to affect our sensory and imaginative selves, to experience that which we cannot see or cannot grasp. Similarly the engineers Naysmyth and Carpenter in 1885 in their longing to inhabit the, at that time, uninhabitable moon, built models and structures which they then photographed as an attempt to draw the invisible or un-graspable towards us, towards our human sensorium.

This Excited Surface and many of my other artworks aim to create an 'atmosphere' or to offer a sense of inhabiting or experiencing a scientific phenomenon. I am always fascinated by the precognitive effect that sound has on the body, artworks that are sensorily felt before they are conceived in the mind that act upon our body prior to acting upon our thoughts. Pallasmaa writes of things at the peripheries of thought as having a more profound effect on our unconscious than things at the centre. (21)

Our perception of the distinction of things affords a kind of completeness or resolve. Distinction offers refuge, of language as the definitive tool in unifying our experience of the world. Conversely, the nebulous or formless often defy language and distinction, they are that which may not be pointed to or described. Pallasmaa writes of Bachelard's distinction between 'formal imagination' and 'material imagination' in his exploration of poetic imagery. Pallasmaa writes that '(Bachelard) suggests that images arising from matter project deeper and more profound experiences than images arising from form. Regarding Bachelard's claim, whilst sound is not matter, its lack of physical form can often allow for 'deeper and more profound experiences.' (22)

The skin of the world 1

In the opening chapter 'The Mind of the Skin' Ashley Montagu writes; 'The skin, like a cloak, covers us all over, the oldest and the most sensitive of organs, our first medium of communication and our most efficient of protectors. (14)

Do we end at the outer layer of our skin? If we look very closely, perhaps with a magnifying glass or closer still with an atomic microscope we can see that at the seeming boundary of our bodies there is little evidence of an absolute division between self and environment. Karen Barad argues that there is an ambiguity around the boundaries of bodies and questions the distinction between the concepts of self and world. This is not just a matter of scale but of manifold, dynamic relationships of the world and the materiality of our human bodies. Barad writes:

'Beyond the issue of how the body is positioned and situated in the world, or rather, as "part" of the world (i.e., "being-of-the-world) not (being-in-the-world") That is, the central issue for my purposes concerns the nature of the bodies materiality. I will argue that matter itself entails *entanglements* - that this is its very nature.' (1)

The indeterminacy of the boundaries of bodies as 'being of the world' is echoed by Merleau-Ponty. Although here the reciprocity or entanglement of 'being of the world' is described as a body made of the flesh of the world ' that we are of it, that between it and us there is *Einführung* - a culmination of materiality and subjectivity.

Earlier in this article I refer to the outer edges of our atmosphere, the ionosphere as the skin of the world. The importance that we place on the earth's crust, the denser surface of our world, is possibly due to our tendency, because of our materiality, to emphasize gravitational

forces rather than magnetic ones - the visible, material, physical stuff of the world as a tangible thing that we can touch, that draws us into it as we walk. The ionosphere, also bound to the earth by gravity is an invisible mutually dynamic system that is brought into being by the interaction of photons which strip molecules and atoms of their electrons, thereby creating the and producing a plasma.

'While the Earth's gravitation force is strong, its pull is not strong enough to prevent the escape of all the gas in the atmosphere, and a small amount of the atmosphere is continuously escaping into space.' (23)

The ionosphere is a being in between, formed by the inner earth and our star millions of kilometres away. It is a mutually created dynamic intra-active body enfolded around our earth by an array of forces.

On touch

'When two hands touch, how close are they? What is the measure of closeness?' (2)

The pilomotor reflex is an involuntary response of the hair follicles causing tiny muscles at the base of each hair to contract, pulling the hair erect. This ciliated sense can be both exogenous and endogenous, stimulated by our environment, by cold or touch or by an inner arousal, listening to a particular piece of music for example.

'The eyes want to collaborate with the other senses. All the senses, including vision, can be regarded as extensions of the sense of touch-as specialisations of the skin. They define the interface between the skin and the environment-between the opaque interiority of the body and the exteriority of the world. In the view of Rene Spitz, 'all perception begins in the oral cavity, which pervades as the

primeval bridge from inner reception to external perception.' (22)

In this work my aim was to find an opening where we might experience longing or desire as a property of things or systems and not just as humans or non-human animals. The purpose of this was to explore the concept of matter as desirous, as having agency with gravity and magnetism as its facilitator. Barad's agential realism proposes that things come into being through intra-actions, and gives primacy to these intra-actions rather than the things themselves. Moreover it questions the nature of distinction between bodies, objects and space.

As a young student of Fine Art one of the exercises in the life-drawing class was to draw without making distinct boundaries between things and others, and things and space. I used to have to squint to do it, to see the dark bleed into the light and the dissolving of bodies and objects into space. This focused attention to the in-between, to the gradually changing relationships between things due to the rotation of the earth around the sun, or atmospheric conditions or the miniscule movement of bodies, including mine - the still-life was anything but still. It was a lesson in ephemerality where each thing has a temporal emphasis in an ever-changing space. The indistinct edges of things or bodies a penumbra belonging to neither bodies or space but between.

'(She) Barad builds from the theories of Niels Bohr to propose an ontology in which matter "intra-acts" or mutually creates, which approaches a Panpsychist cosmology and parallels animist cosmologies in which reality is an ever-shifting process carried out by mutually creating subjects.' (25)

Panpsychism is an ancient philosophy that proposes that there is consciousness or sentience everywhere, that consciousness is not only the possession of mammals but also other seemingly inert objects or dynamic systems.

Panpsychism is also considered the oldest philosophy particularly in its evolution from and its relationship to animism. Panpsychism proposes that matter is vibrant, fecund and sentient. There are many strands of Panpsychism, some propose that natural bodies, for example, rivers or tightly bound forests are in some way conscious.

'Henri Bergson refers to matter as an 'uninterrupted continuity'. An immense body in which all elements act reciprocally on one another, the outlines and surfaces as of objects a limit of our perception "solidity is far from being an absolute state of matter"' (7)

'Between the supposed molecules of bodies the forces of attraction and repulsion are at work. The influence of gravitation extends throughout interplanetary space. Something, then, exists between the atoms. It will be said that this something is no longer matter, but force. And we shall be asked to picture to ourselves, stretched between the atoms, threads which will be made more and more tenuous, until they are invisible and even, we are told, immaterial.' (3)

And whilst Barad's agential realism does not refer to panpsychism specifically it haunts at the peripheries of the concept. In light of Barad's project, early panpsychic approaches to consciousness or mentality or sentience appear rudimentary.

In the field of physics there is no touch, touching is only an interaction, an electromagnetic repulsion of electrons, an excitement of particles and fields.

The doppelganger sun

The birth of our sun and solar system was formed in a vast expanse of space where gravity pulled dust and gas together forming the sun and then later the planets. This gravitational contraction of dispersed matter and gas into discrete objects held in place by the gravitational pull of the sun and each of the planets, and each of the planets to greater or lesser extents on each other, is expected to continue for around several billion more years when the sun will begin to die. Solar physicists predict that the sun will expand, as it will no longer be gravitationally stable due to exhausting its hydrogen core. This expansion will free the outer layers of the sun from the core, which will form nebula as they drift through the solar system consuming the planets as it enlarges. Eventually the sun will become a white dwarf, a white-hot core surrounded by a halo of planetary nebula. (9)

In his novel, *Cyclonopedia: complicity with anonymous materials*, Reza Negarestani puts forward the idea that oil, being made from the crushed bodies of ancient things that had once been alive, has some form of collective sentience. In his book, oil is a chthonic entity that wells up from the crevices and underground pools of the earth to free itself and intoxicate human behavior causing the decline of our environment via capitalism and war. Oil here is referred to as a black or dark sun calling out for the destruction of the earth via war machines and pollution. Negarestani refers to oil as 'The Black Corpse of the Sun' (16) intoxicating human behavior and bringing about an apocalyptic present via war. Negarestani writes of cult groups who 'spoke always of a buried terrestrial sun which must be exhumed, a rotting oozing black flame, the black corpse of the sun'. (15) Imagining the agency of these deeply connected interactions between the celestial bodies Negarestani writes: 'Interplanetary space was once believed to be an innocent emptiness but it is the cavernous host of cosmic

deluges consisting for the most part of solar winds and planetary magnetospheres'. (17)

Negarestani goes on to describe the unleashed solar wind in its interaction with the earth as a 'cosmic- semiotic, ionized howl'. (18)

In the introduction of the book 'Arts of Living on a Damaged Planet' the authors, write of a need to engage with other telluric temporalities, systems and beings. 'Curiosity is an attunement to multispecies entanglement, complexity, and the shimmer all around us'. (26) The authors write of the hauntings of dead species both animal and plant and the eerie indirect disturbances of these ghosts with which we share our inhabitation of the earth. This shimmering is a method of attunement not just with the earth's species, the inner chthonic inhabitants of our planet or surface dwellers, but also to our wider habitat, the gravitational pull of the moon, to asteroids shedding bacteria as they crash through the outer atmosphere of our planet, of magnetic and atmospheric forces and less so the with the gravitational tug of other planets with which we share our sun and with galaxies beyond our system.

'Haunting is quite properly eerie: the presence of the past often can be felt only indirectly, and so we extend our senses beyond our comfort zones. Human-made radiocesium has this uncanny quality: it travels in water and soil; it gets inside plants and animals; we cannot see it even as we learn to find its traces. It disturbs us in its indeterminacy; this is the quality of ghosts'. (27)

Negarestani's black sun, oil once constrained in the fissures and cracks deep in the earth's confines, made up of the bodies of billions of once living things, as it escapes becomes a symbolic precursor or future haunting of the end of the earth, the viscous fluid body of the oil and

subsequent burning of fuel creating a doppelganger sun in the form of a blackened, burnt earth.

The skin of the world 2

This Excited Surface places participants in the sonic realm of the ionosphere, the mutable layer of our atmosphere that protects the earth from radiation whilst allowing photons, bacteria and other space debris to filter through to earth. The ionosphere is the skin of the earth as it is touched by the sun's radiative action and comes into being through the interaction with the sun. The skin of our bodies acts as a porous surface, the interface between ourselves and the environment. Our skin is constantly filtering air, reacting to temperature changes, signaling hormonal drives, fears and desires. In likening the ionosphere to the skin of our bodies we may be able to imagine the invisible interactions taking place between things and selves, things and things, and selves and selves. In sonifying this interaction we are aurally placed where the sun and the earth meet, where the ionosphere draws towards the sun like the pilomotor reflexes of the tiny hairs on the skin. The desirous nature of the narrative in *This Excited Surface* evokes the dynamic interplay between two bodies or systems, where we inhabit the in-between, the invisible interactions that take place where attraction and repulsion coalesce and separate.

Narrative of the work

waiting

the light arrives at an angle, stripping bare electrons,

an excitement of photons and ions, extending the outer edges of the earth's atmosphere, drawing it towards the sun.

our sun both enables and limits our seeing

Illuminating the layers of our atmosphere, but it is in its absence that we can see farthest.

these bodies

the stellar mass and our wet, viscous earth create a new skin,

the ionosphere, a relational mutable edifice – a meeting place where the earth and the sun first touch.

the earth turns on its axis enabling visions into vast distances, the edges of our galaxy and beyond.

it is the absence of light from our star which affords our deepest ocular reach, darkness where our gaze lingers on the billions of flickering incandescent suns, light years away.

in order to observe the sun early astronomers needed to look away from it to see its manifestations

they would use a bowl of oil to study solar activity and in doing so created its dark doppelganger looking up from the earth.

she is a constructor of dark spaces, an architect of light condensers, lenses, optics,

channeling light into measurable packets from the immensity of the sun, the boiling, fluid, sphere.

vision travels faster than the sense of touch - the speed of light, an instantaneous saturation, of seeming surfaces,

depths, openings.

is it ever possible to touch something, someone?

if so is it measurable?

at what point might this take place,

in the anticipation of the eye? the arousal of the skin?

as physicists would have it, there is no touch,

touch is only an electromagnetic interaction- a repulsion of electrons – an excitement of particles and fields, we never truly touch anything.

and as our earth rotates, the excited surface of the atmosphere, the intricate interaction between photons and particles are uncoupled as we shift into into darkness,

an unfusing, a temporary respite or tearing apart.

here in the darkness, a form of blind vision, a diminishing of sight when the sense of touch is fully aroused, a desire to connect, as if in the process we know that this connection is impossible, temporary.

outside nothing but overwhelming light

an absence of nuance

she closes her eyes

every 24 hours, this cycle of arousal then retreat

no need to engage the distance of vision,

*the sensation of a million photons, burning, intimate
threading, fusing together,*

a ciliated sense.

Acknowledgements

I would like to thank Jay Auburn and Suvi-Eeva Äikäs at dBS for working with me on the sound design and Mark Acumen and Joshua Ball for their sound and installation expertise, Andrew Bone for his voice-over and to Plymouth University for supporting this work. I would also like to thank the staff and residents of Hamoaze House for their interest and support of the project.

References

1. Karen Barad. 2007 Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning, Duke University Press, 160.
2. Karen Barad. 2012. On Touching – The Inhuman That Therefore I Am (v1.1), Preprint – Forthcoming in The Politics of Materiality ed.by Susanne Witzgall & Kerstin Stakemeier, 1.
3. Henri Bergson. 1988 Matter and Memory, Zone Books, 200.
4. Jane Grant. 2013 Heliosphere: Intensities, the ionosphere and the solar wind, Technoetic Arts, Volume 11, Number 2, DOI: https://doi.org/10.1386/tear.11.2.123_1
5. Jane Grant. 2010. Soft Moon. <http://www.janegrant.org/soft-moon-2010>
6. Jane Grant. 2012 Orbit. <http://www.janegrant.org/orbit-2013>
7. Jane Grant. 2013. Soft Moon: Exploring Matter and Mutability in Narratives and Histories of the Earth-Moon System, Leonardo Journal. https://doi.org/10.1162/LEON_a_00637. 437
8. Oliver Grau. 2003. Historic Spaces of Illusion, MIT Press, 54.
9. Beth Hufnagel, Biography of a Star: Our Sun's Birth, Life and Death. Retrieved December 12, 2017 from <https://astrosociety.org/edu/publications/tnl/39/sun2.html>
10. Jacques Lacan. 1966. Écrits, W.W. Norton & Company, New York, 93 – 81.
11. Brian Massumi. 2002. Parables for the Virtual: Movement, Affect, Sensation, Duke University Press, 140.
12. Brian Massumi. 2002. Parables for the Virtual: Movement, Affect, Sensation, Duke University Press, 140.
13. Maurice Merleau-Ponty. 1968. The Visible and the Invisible. Northwestern University Press, 248.
14. Ashley Montagu. 1971. Touching: The Human significance of the skin, Harper and Row Publishers, 1.
15. Reza Negarestani. 2008. Cyclonopedia: Complicity with Anonymous Materials, re.press, Melbourne Australia, 12.
16. Reza Negarestani. 2008. Cyclonopedia: Complicity with Anonymous Materials, re.press, Melbourne Australia, 26.
17. Reza Negarestani 2008 Cyclonopedia: Complicity with Anonymous Materials. re.press, Melbourne Australia, 148.
18. Reza Negarestani 2008 Cyclonopedia: Complicity with Anonymous Materials, re.press, Melbourne Australia, 149.
19. Juhani Pallasmaa. 2005. The Eyes of the Skin: Architecture and the Senses, John Wiley & Sons, UK, 59.
20. Juhani Pallasmaa 2005. The Eyes of the Skin: Architecture and the Senses, John Wiley & Sons, UK, 72.
21. Juhani Pallasmaa 2005. The Eyes of the Skin: Architecture and the Senses, John Wiley & Sons, UK, 42.
22. Juhani Pallasmaa. 2014. Space, Place, and Atmosphere: Peripheral Perception in

- Existentialist Experience, in *Architectural Atmospheres: On the Experience and Politics of Architecture*, Ed. Christian Borch, Birkhauser Verlag, 35.
23. C.T. Russell, J.G. Luhmann, R.J. Strangeway. 2016. *Space Physics – An Introduction*. Cambridge University Press, 26.
 24. Susan Sontag. 1977. In *Plato's Cave in On Photography*, Anchor Book, Doubleday, 3-24.
 25. Priscilla Stuckey. 2015. The animal versus the social: rethinking individual and community in western cosmology in *The Handbook of Contemporary Animism* Ed. G. Harvey, Routledge, London and New York, 205.
 26. Eds. Anna Tsing, Heather Swanson, Elaine Gan Nils Bubandt. 2017. *Arts of Living on a Damaged Planet*, Minnesota University Press Minneapolis, G11.
 27. Eds. Anna Tsing, Heather Swanson, Elaine Gan Nils Bubandt. 2017. *Arts of Living on a Damaged Planet*, Minnesota University Press Minneapolis, G2.
 28. Yulia Ustinova, *Cave Experiences and Ancient Greek Oracles*. 2009. *Time and Mind: The Journal of Archeology, Consciousness and Culture*, Volume 2- Issue 3, November 2009. DOI: 10.2752/175169609X12464529903092. 265-286.