

# An investigation of a possible foundation for new poetic-scientific research instruments\*

December 31, 2017 · Philosophy

Dr. Gus Koehler Ph.D.<sup>1</sup>

1 Time Structures

Koehler G. An investigation of a possible foundation for new poetic-scientific research instruments\*. Emergence: Complexity and Organization. 2017 Dec 31 [last modified: 2018 Apr 22]. Edition 1. doi:

10.emerg/10.17357.ac48430727ee2c5155838b56ba8c369e.

## Abstract

The Nobel Laureate Physicist Frank Wilczek posed fundamental questions that are very hard to answer within the existing scientific paradigm, its ontology and epistemology: “Does the world embody beautiful ideas? ... Is the world a work of art? ...Is the world considered as a work of art, beautiful?” To my full sensorium—including speculative reason and poetic knowing—the answer is yes but this “Gap” between science and the arts cannot be mapped or explored or analyzed with the limited set of available tools built on speculative reason’s ontology or its associated epistemology alone. (Epistemology is about the way we know things; ontology is about what things are.) “Suchness” or the thing in itself is not part of speculative reason’s ontology and is not accessible to experimental design. For example, consciousness as a quality of mind is not discoverable by physics’ speculative reason driven investigations of the body. In contrast and as will be argued, poetic knowing, surrealism, meditation, “leaping over” and directly revealing one’s “natural face” are applicable to such a multiverse. So exploring and discovering the Gap suggests it needs a clear ontology that guides this mapping supporting an appropriate epistemology that merges speculative reason (science), poetic knowing, and somatic experience. This paper seeks to lay a foundation for this effort and to identify tools useful for carrying it out.

## The problem

The Nobel Laureate Physicist Frank Wilczek<sup>1</sup> posed fundamental questions that are very hard to answer within the existing scientific paradigm, its ontology and epistemology: “Does the world embody beautiful ideas? ... Is the world a work of art? ...Is the world considered as a work of art, beautiful?” To my full sensorium—including speculative reason and poetic knowing—the answer is yes but this “Gap” between science and the arts cannot be mapped or explored or analyzed with the limited set of available tools built on speculative reason’s ontology or its associated epistemology alone. (Epistemology is about the way we know things when ontology is about what things are.) “Suchness” or the thing in itself is not part of speculative reason’s ontology and is not accessible to experimental design. For example, consciousness as a quality of mind is not discoverable by physics’ speculative reason driven investigations of the body.<sup>2</sup> In contrast and as will be argued, poetic knowing, surrealism, meditation, “leaping over” and directly revealing one’s natural face are applicable to multiverse.<sup>3</sup> So exploring and discovering the Gap suggests it needs a clear ontology that guides this mapping supporting an appropriate epistemology that merges speculative reason (science), poetic knowing, and somatic experience.

Image not readable or empty

5e15a11-bbbc-4ab6-8c06-3264a2923e02/uploads/2018/02/a5e15a11-bbbc-4ab6-8c06-3264a2923e02-300x190.png

**Fig. 1: Natural systems compared to L-systems**

A second issue, and a foundational one, is Von Uexkuell’s concept of the extended *umwelt* being that all animals live in a unique “extended” world that is species specific including its’ ontology and circumscribed epistemology. Quoting Thomas Aquinas: “whatever is known is known according to the manner of the knower”<sup>4</sup> Here not only does the scope of our *umwelt* limit the scope of knowing but also defines how a Gap emerges and its space-times<sup>5</sup> In taking this position we will also reject the popular ontological view that a single unquestionable “universe” exists. In contrast, we will assert that there are multiple worlds—local and distributed—producing different ontologies and epistemologies mapping the possibilities for multiple Gaps, not only in them but between them and on their edges.<sup>6</sup>

## What this speculative reason-poetic knowing approach has contributed to Science

In many cases the discovery of a great science changing idea in the Gap left by a discipline’s paradigm came from various kinds of knowledge hybrids like those being discussed here. Descartes’ insight came from an angel in a dream; Pasteur’s from an artistic insight of the chirality of some crystals; Einstein’s vocal expression of the importance of the arts to scientific research; and Kekulé’s daydream leading to the discovery of the benzene ring (see Wikipedia for each scientist). Like Descartes the way forward is not known but insights can be discovered and composed or painted or meditated upon in the company of speculative

reason that points forward in a messy way.

Returning to Wilczek's questions about beauty, a limited insight can be drawn from the visual perception of the "hard" and fixed mathematical beauty of simulated trees. Such beauty is abstractly related to the beauty that is *continuously emergent* in the *hic et nunc* or "here and now" of living trees (Figure 1). What I will call a "Gap" or "error"—a messy concept—has appeared from such a fragmentation in knowing and understanding of what the beauty of complete "treeness" is. Experience of the gap at this stage is like a "dream" and could provide similar insights and guidance.

## Beauty of whole complex systems

Paradigmatic limitations extend to not seeing how a tree or plant *shares* its body and flows and is part of the beauty in the present instant of its ecology. Here I am referring to seeing the seductive rhetoric of the rose, the orchid, or the forget-me-not communicating their complex synesthesia of smell, taste, touch, color, and form within their domain not only to other trees but also to within the human body and the bodies of birds, insects, and other animals. Such multiple evolving flows are inserted into and shape such living bodies as scents, food, and empathogen-entactogen. This narrowing, even exclusion of these other ways of knowing lies at the center of this Gap; the merely orderly cannot address a fundamental characteristic which is that trees are fully beautiful across integrated multiple time-space scales using various ways of knowing. In summary as result of the paradigmatic creation of the knowledge Gap and its circumscribed results, as Democritus pointed out: "It will be apparent that it is difficult to discern which properties each thing possess in reality."<sup>7</sup><sup>1</sup>

Put more directly within the context of studying the occurrence of knowledge Gaps involving complex systems, the apparent epistemological narrowing of the qualities associated with the wholeness of a complex system into only those parts amenable to the requirements of the scientific method and mathematical space impoverish our ability to understand critical components of a system's dynamic wholeness, its' *hic et nunc* including values (what a healthy living system is), creativity, change, and growth as well as all of the other characteristics associated with somatic knowing, art, etc. (This issue was also raised in a slightly different way by two complexity theorists Byrne and Callaghan,<sup>8</sup> and as developed for the study of space by Koehler.<sup>9</sup> This lack of a theoretical foundation for developing an informed intuition of a complex system's changing pattern as a whole, including critical points for influencing the values of associated processes or morphodynamic rules to maintain or change its valued goals.

## New approaches to old complex system issues

Examples of complex system Gap problems that my suggested tools might help clarify include<sup>9</sup>: Urban studies plagued by the difficulty of understanding spatial-temporal patterns (the Gap) in complex transportation systems that disrupt efforts to create an efficient spatial organization now or in the future;<sup>10</sup> a lived physical place is not a "universal space" in the mathematical sense but rather particular qualitative places generating comparatively different Gaps;<sup>11</sup> a mathematical measure constructs a timeless place which does not change since the measurement apparatus and concepts do not change much like a lived place does creating an evolving future Gap;<sup>12</sup> dynamic interactions between place and a resident's sentiments suggest that static definitions of urban places generate Gaps that are inadequate for predicting or understanding sentiment generation, the accompanying state of mind (PTSD) and flow of consciousness; the actual process of creating a complex place in space is dissected such that various causal paths are emphasized over others even as the holistic and often varying creative process of creating a place is marginalized. Here an ecological fallacy occurs in this dissection because the way a place is sliced is in appropriately generalized to the unsliced whole.<sup>13,14</sup>

Architecture, which involves at its heart the creation and maintenance of complex systems, shows why a focus on wholeness including values and the aesthetics associated with a buildings design, its operation, and manner of change and growth is a Gap but one necessary to understanding architectural performance. These issues apply equally well to political, social, and psychological systems. The architect Alexander,<sup>14</sup> in his book the *Nature of Order*, writes:

*[The concept of "nothingness"<sup>2</sup> in Heidegger's sense] is integral to the maintenance of a complex system. Nothingness<sup>2</sup> ... emphasizes the danger of over-optimizing and re-engineering to the point where there is zero rest, zero inactivity, and every second is filled with predetermined activity. Living organisms [like organizations] are certainly not like that. They rest, they store food, they can sustain injury and survive. In each overall pattern of activity, there needs to be some time for reflection, for quiet, for nothing. Otherwise, how can the organization possibly learn and improve over time let alone recover from some unforeseen catastrophe?*

...In the most profound centers which have perfect wholeness there is at the heart a void, which is like water, in infinite depth — surrounded by, and contrasted with the clutter of the stuff and fabric all around it....Is there a way that the presence of the void arises mathematically, as part of a stable unified structure, or is it merely a psychological requirement? It is the latter. A living structure can't be all detail. The buzz finally diffuses itself, and destroys its own structure. The calm is needed to alleviate the buzz.

Various new and unanticipated knowledge Gaps related to those enumerated above will emerge in the future accompanying new technologies such as synthetic biology and engineered organisms in a synthetic environment. These Gaps are barely hinted at now let alone recognized but could be very significant.<sup>15</sup> For example, knowing and mapping new emergent Gaps may involve biochemically new DNA inserted into the existing ecology, combined with digital “living” computer programs that redefine what is meant by “life” in such an extended complex system. New concepts of living space-time are likely. Examples include: Androids; sensing bionic skin; so called brain hacks; direct brain stimulation from outside of the skull; bio-nano engineered implants; trans-species organ transplants; artificial intelligence and 3-D biological printing in or on living tissue.<sup>16·17·18</sup> Such a Gap requires integrated multi-sensor explorations, newly invented symbols and knowing capacities such as those proposed here that are unexplored at this time.

## Definition of the knowledge gap

I will define a knowledge Gap as (see Figure 2):

*The intuitive deep recognition that one's knowledge generated by any means of a phenomenon or process is critically incomplete, with this barely understood Gap being seen as, for example banal or as a wondrous mystery, or merely as a disembodied abstraction. This recognition of a Gap is constructed, at least partially, within the hic et nunc infrastructure of the observer's self-organized space-time instant in nothingness.<sup>3·19·20·21</sup> Our method for such knowledge construction is suggested by Blake: “What is now proven was once only imagined”.<sup>22</sup>*

Imagination as the starting point, its attitudes and dual methods, poetic and speculative reason are, as far as their imaginative experience goes, one and the same. Building on this, Surrealist dispositions and techniques (automatism, games, illogical juxtapositions, dislocation, etc.) allow the Gap's silent mystery (the previously unknowable) to speak and inform the now emergent known. Such a strategy, since it is partially driven by the individual's surrealist approach can only be a necessary method, but not sufficient, because the mystery speaking in its *hic et nunc* reveals itself only during its extension into the next instant often in a chaotic deterministic manner.<sup>23</sup> Within any given set of order parameters including those of space-time,<sup>19</sup> knowledge via imagination in the Gap is not discovered but continuously constructed from linear processes, non-linear attractors, interactions, bifurcations, especially in cascades of micro-bifurcations, a process called a macro-, or *mu*-bifurcation,<sup>24</sup> and the consolidation of shifting memory fragments and poetic memes. Because no single method within itself is sufficient, both the implicit structure of deterministic parameters and the unpredictability of unconscious processes are necessary for imagination's transformative reification of what was previously only imagined into new conceptual constructs or artifacts (Figure 2).

fc11f646-4f20-452b-8a19-09bbfb5900c0

Image not readable or empty

<https://journal.emergentpublications.com/wp-content/uploads/2018/02/fc11f646-4f20-452b-8a19-09bbfb5900c0-300x208.png>

**Fig. 2: The knowledge gap and its investigation**

Errors in approach and understanding are a kind of Gap that stimulates the imagination too. Katheryn Schulz<sup>25</sup> points out that: "...error is endlessly diversified; it has no reality, but is the pure and simple creation of the mind that invents it. In this field, the soul makes room enough to expand herself, to display all her boundless faculties, and all her beautiful and interesting extravagancies and absurdities." This understanding Gap, this error in knowing results in some cases from the domination of one mode of knowing and the distorted transition from this one mode of exploration—the "objective"—to another, here an often trivialized poetic. This transition should reveal difference and connection; it's a void both empty and full that currently cannot be filled because the dominant paradigm for knowing Being resists. This resistance is one of the basic causes for continuation by restriction of knowing of the Gap. But, each tree's existence emerges as the interaction of the "ten thousand things" as the Taoists would say, synergistically expressed as the flow of the beautiful, mythical, scent, color, physical and energetic at an instant—perhaps a kind of blended fractal relationship—resulting from interactions among and between these boundaries. Such a Gap is also a Gap in the space of awareness which was thought to be continuous but is found to be full of cracks, blind spots, and empty spaces particularly when the trees *hic et nunc* (here-and-now) is sought out to be known. It is here that we begin to feel and know the root of error.

## Knowing and the problem of wholeness

Trees, people, societies, etc., are not born of a mere assemblage of units each independently occupying a here-and-now. They are not a wandering troop of sensations in the void nor a system brought together by ephemeral judgments, nor a set of objects whose being is fixed by the norms of objectivity. In fact the visible, the auditory, the somatic, and the energetic is each and in combination a time-space landscape, a here and now topography as cultivated or uncultivated time-spaces yet to be explored, being *wild being* producing the Gap. Clearly a new epistemological philosophical investigation is needed to invent the tools to learn again to see the suchness of a world which was damaged with the virtually unitary ascendancy of speculative reason. (This separation may be relatively new. See: Di Pippo.<sup>26</sup>)

The second proposed tool is poetic knowing. The activity of poetic knowing is not in itself an activity of knowing, but of *creation* of an art production, performance or of an ongoing dynamic or dialectic (McLuhan's Probes) in accordance with that Gap's inner needs and its own good. It is a knowledge which cannot be expressed in notions and judgments being "unspeakable", but which is an experience of suchness and "is-ness" rather than logical knowledge. For example, interpretation and creation out of the Gap can be out of the subconscious or poetic analysis; in essence what the surrealists call the "automatic." It is a creative experience, because it wants to be expressed, and it can only be expressed in a work. Such a work for example can involve special McLuhan Gap probes<sup>4</sup> such as thought pictures or illustrations of the mysteries, riddles as pictures, "to reach the intellect via the senses", allegories, musical homophony, automatism, games, illogical juxtapositions, dislocation, the emergent, and word play. Spiritual and subconscious interpretations of such productions ignore the fact that the picture-poems of alchemy—and perhaps those generated here—are connected with scientific productions with the poem teaching about changing processes in the material world.<sup>7</sup> Perhaps Duchamp can further clarify these points in practice with his comment on his "ready-mades" like the men's urinal he exhibited as art:

*...you can cut off the artist's hands and still end up with something that is a product of the artist's choice since, on the whole, when an artist paints using a palette he is choosing the colors. So choice is the crucial factor in a work of art. Paintings, colors, forms, even ideas are an expression of the artist's choice. So you can take this even further if you want, by saying: why go to the trouble of using your hands at all? So the idea of making something that is not physically created by the artist, that simply stems from choices he has made, that is, something already created like the ready-mades, was valid—personally speaking, at any rate,*

*....I believe that a picture, a work of art, lives and dies just as we do. That is, it lives from the time it's conceived and created, for some 50 or 60 years, it varies, and then the work dies. And that is when it becomes art history. So, art history only begins after the death of the work, but as long as the work lives, or at least in the first 50 years of its life, it communicates with people in the same period who have accepted it or rejected it and who have talked about it. These people die and the work dies with them. And that is where the history of art begins.<sup>27</sup>*

Such a created poetic work for investigating the Gap must be significant of something other than itself; this object must be a sign as well as an object; a meaning must animate it, and it must say more than it is. Looking at a single measurement or poetic creation by itself tells us little. What we need is, as Bateson<sup>28</sup> would say, "news of difference." That is, what is the instantaneous difference—the mystery—expressed as a uniform creation between objective measurements and poetic creations that reveal the Gap? Looking more deeply at our proposed method, examples of which are discussed in more detail below, suggests that the integrated artifact-data results are translated into diagrams, videos, etc., to reveal Gap that are, in truth, only one of the projected process of the researcher/artist themselves.<sup>29</sup> In turn the contemplation of the results are intended to excite the imagination of the viewer so that a sort of "mystic alchemy or marriage" of the types of knowing can take place revealing what is within the Gap through the act of visual, somatic, musical and other forms of contemplation of this data-artifact juxtaposition<sup>30</sup>

From the perspective taken here there is no unitary "natural world" at any level. This view condensed in the hermetic dictum "as

above, so below” where the signatures of such multidimensional nature may be found embedded in science, the human body and poetic imagination (poetic knowing and soma).<sup>31-32</sup>

Latour and Woolgar<sup>33</sup> provide a sociological context for the construction of scientific and for us artistic facts derived for investigating the Gap. The experimental methods suggested involve certain studio and laboratory practices of perception, problem solving contemplation, language, somatic movement and observation, and symbolic creations that upon investigation would yield insight into what these strategies select for or against to know, see, or interpret. (See Wood’s<sup>34</sup> discussion of Gombrich’s Art and Illusion and <https://youtu.be/xRel1JKOEbl>)

The methods proposed here are not as wild and crazy as they may seem upon first blush. Studies of a scientific laboratory and their cultures conclude that, as Gearin<sup>32</sup> points out “...the methods of physicists appear to differ considerably insofar as they use metaphors and trade spiritual for figurative approaches when ‘journeying through’ cognitive tasks, embodied gestures, and visual representations of empirical or natural processes.” This is all embedded in the politics of scientific paradigms<sup>35</sup> It is no coincidence that contemporary state-of-the-art scientists are employing forms of alchemical language and practice in advanced types of experimentation. Alchemical and hermetic thought and practice were highly influential in the emergence of modern forms of science<sup>36</sup> and seem to survive as unsystematic metaphors.

The knowledge contained within the Gap “...does not behave mysteriously or secretively; it speaks a secret language. In order to penetrate and interpret this language, I am suggesting that yet another mystery be projected—the investigator’s own unknown psychic background—into what is to be explained”.<sup>37</sup> Strictly speaking, projection is never made: it happens, it is simply there as in Surrealism. These projections are part of the method, tools, and perception of both poetic knowing and speculative reason; understanding the Gap is an emergent of this mixing.

### Speculation on tools to visualize and analyze the gap

A new philosophical cartography such as that being proposed is meant to generate news of difference in the Gap and between it and the system it is embedded in. The starting point is naked insight. To harvest the implications from such insights requires a new medium, one that links speculative reason to poetic knowing and its creations. This tool and medium would allow manipulation of temporal and space systems/symbols, something akin to poetic knowing, that would allow for the private experience of composing or reading or watching a poem, a dance, a painting and the visualization methods of the Gap’s *shicet nunc*. A portion of the solution might lie somewhere between the composition by the investigator of two-dimensional surfaces of each way of knowing and the three-dimensional volume including the fourth (or more) of time that is generated by their interaction.<sup>38-39</sup> This could reveal hidden Gap dynamics<sup>19</sup> that manipulate temporal-space systems, and store information in ways such as a work of art or hologram of that work that can be carefully inspected in varying dimensions to generate fascinating new perceptual experiences. Three, four or higher spaces appear to be necessary dimensions for such tools.

e7da6a3c-07b0-461b-aa7c-f2059f034972

Image not readable or empty

<https://journal.emergentpublications.com/wp-content/uploads/2018/02/e7da6a3c-07b0-461b-aa7c-f2059f034972-300x90.png>

**Fig. 3: Examples of finding and experiencing the gap**

For example, the picture above on the left shows an active projection of an evolving pattern of corporate logos (conventional reality) onto a statue of the Buddha in a state of Samadhi. This is an evolving of awareness-embodiment engaged in the creation of conventional reality out of the nothingness of awareness. The Gap is in the active space between the two. As each linked realm moves and changes the news that is the difference evolves and changes in their interaction in varying the content of the Gap.

Investigating a Gap involves both shifting perception and the capacity to interpret symbols and data generated by new tools inserted in the Gap’s space-time and in the researcher’s poetic-speculative reason’s analytic time. Symbolic drivers such as dance and music can be used to sharpen perception to further sense and interpret findings. (For an artistic installation by Yayoi Kusama’s that examines this see: <http://hirshhorn.si.edu/kusama/the-exhibition/> and <http://hirshhorn.si.edu/kusama/infinity-rooms/>.)

Returning to Figure 3, the background bubbles in the left hand picture of the Buddha and trees above are meant to be quantum foam which are illustrated by the painting on the right. This suggests a very complex Gap as one tries to bring together these two autonomous emergent processes, one being physics of emergent bubbles and the other various speculative poetic “meanings” associated with at least some of these multiverses.<sup>19</sup>

Finally, the multiple tree pictures when brought to dynamic life as they are in reality shows how the meaning of each tree-like fractal object varies. One is embedded in an essential continuous breathing and blood circulation exchange tissue processes, and the next as flowing sap, cellular multiplication, driven by photosynthesis in a varying illuminating space created by moon

light as it circles the earth.

## General options for getting started

Here is a preliminary and very tentative list of what we need to do to reveal and understand via speculative reason / poetic knowing the “here-and-now” suchness of the Gap itself:

- It is necessary to recognize the restrictions and limitations of the two continuous processes—speculative reason and poetic knowing—forming the knowing Gap mystery or error. Each has identifiable, distinct states, and symbols, each is capable of defining unique countable dynamic instants in the mutually penetrated Gap. This also involves defining how each interpenetrates the other at the same level. External drivers of our knowing processes should also be identified that may shift the balance of mutual penetration varying their dynamic instants over time.
- An analysis of the Gap’s space-time infrastructure using its continuously changing emergent phenomenological properties is required (see Koehler<sup>19</sup> for details of what follows). The dynamics of a Gap are revealed in its’ time-ecology and regulating heterochrony (Koehler, 2003). The Gap’s *spatial* dimension includes both geographic extensions and sequential morphogenic-like, rule driven parallel timed processes for each time-ecology element that produce hierarchies of evolving developmental and growing forms. How these “flows” penetrate each other should be identified. Flows reveal themselves, in a metaphorical sense, as a multitude of continuously emerging structures<sup>40</sup> For any Gap’s instant in flow-time there is a unique combination of six temporalities, each temporality having particular characteristics. A heterochrony’s temporal dimensions times all of this out. The Borsuk-Ulam Theorem displays space’s six temporalities<sup>5</sup> being constantly in rotational movement in relation to each other creating different instants after instants of a “reality”.
- There are multiple simultaneous, perhaps blended events occurring in the Gap. This allows contrasting symbolic and sense perspectives that the recording instrument can “rotate” or inspect and visualize. This could be inspection of perhaps a dynamic holographic image (below) or some other means for generating alternative perspectives producing a single holistic knowing-creation experience.
- Aligning, even merging simultaneous speculative reason events (like Abraham’s cascades of micro-bifurcations<sup>24</sup>) and emerging poetic instants as they simultaneously occur in the Gap requires a rule of dynamic transformation of the “two-into-one”, or at least the assumption that such a rule exists much like Duchamp’s “infra-mince”. This allows the complex process creating the flow of instants and symbols intuited and/or counted in a particular Gap may be converted into instants counted or intuited as emergent symbols. Such a rule of transformation may also be revealed by McLuhar<sup>41</sup> probes or by the experiences generated by focused knowing sentient visual languages identified below.
- An instrument (video for example) suitable for continuously recording the dynamic flow identified above should be in place. Examples of what such data might look like is included below. Consideration should be given to refreshing the researcher’s own perception. It should be guided by what Roser<sup>42</sup> calls “unknowing as creative heuristic.”
- Following Slattery,<sup>43</sup> at the interface with the Gap the methods and symbols of perception must be actively open to the invention of sentient visual languages and symbol creation (artistic, embodied), for revisualization of meaning in and of a particular Gap. This includes, for example: *it’s* logic or way of speaking and its symbolic speech; the self-aware experience of knowing-awareness “in-there”; tracing inner-outer barriers; clashing modes of knowing; identifying methods of merging and inventing new ways forward including, shifts in consciousness of energetic and somatic processes producing new modes of analysis and its expression-perception. As Duchamp would have it: “...like in infra-mince which is a fluid movement between two physical states—a transition of both connection and difference; a void both empty and full that can’t be defined but can be known in a creative act. Your mind connects the dots but nothing really adds up and it becomes something completely different” (Roser<sup>42</sup> citing Duchamp).

## Thoughts on tool options for visualizing the knowledge gap

**Animation:** The process of knowing the Gap with multiple tools could be animated so that differences can emerge. (See the video “Ryan” at <https://aeon.co/videos/artistic-genius-and-fragility-intersect-in-this-surreal-oscar-winning-animation>)

e9183808-d3dd-41bc-8f68-f718affb5122

Image not readable or empty

<https://journal.emergentpublications.com/wp-content/uploads/2018/02/e9183808-d3dd-41bc-8f68-f718affb5122-300x103.png>

Fig. 4: Video “Ryan”

Here dissection of various portions of “Ryan’s” anatomy and color overlays all depict how he knows himself in a constantly evolving instant in his current *hic et nunc* or “here and now” translated to the video. Animation allows insertion of colors, a story line, abstract objects (scientific measurements) and indicators of feeling and intensity. This is an entirely open virtual space with its own knowledge limitations<sup>2</sup>

**3-and 4-d Visualizations of fractals.** The following 3- and 4-D videos of the Mandelbrot set (or other attractors, etc.) could be tied point-to-point to a poetic production object from the same Gap. (Both videos must be brought to life by clicking on the link <http://www4.ncsu.edu/?zwoodst/mandelbrot.html>)

ff1eebd2-cecd-427c-bc87-fdd02127eab2

Image not readable or empty

<https://journal.emergentpublications.com/wp-content/uploads/2018/02/ff1eebd2-cecd-427c-bc87-fdd02127eab2-270x230.png>

Fig. 5: Approximating the 3-D and 4-D Mandelbrot Set

**Holographic Poetry Visualizations:** The artifact of the poem or poetic knowing/speculative reason Gap floats in the air inside a cylinder, as seen in a 720-degree space. Here the poem or our merged objects can be read in any direction, at any speed. Such a visualization will produce new insights and meanings. Hyperlinked probes provide a cartography of particular scientific-poetic Gap as an emergent image from its poetic knowing.

adbcbff7d-b2b6-4ca7-b4c4-e23cab4a9b0b

Image not readable or empty

<https://journal.emergentpublications.com/wp-content/uploads/2018/02/adbcbff7d-b2b6-4ca7-b4c4-e23cab4a9b0b-300x101.png>

Fig. 6: Holographic poetry visualized

**Xenolinguistics Visualizations:** Xenolinguistics can enable investigation of a broad and paradoxical spectrum of linguistic phenomena demonstrating the un-speakability of the mystical, to the instrumental magic of the songs of the shaman or curandera and on to the full range of embodiment.<sup>43</sup> We know this as the Gap when we encounter it; essentially the answer is to speak or hear the unspeakable from these domains. Interior dialogues with the Other, whether framed as the voice of the Logos, an alien download, or personal or group communion with ancestors and spirits, can be and are analyzed by Slattery’s methods using sentient visual languages.

Sentient visual languages— such as Slattery’s “Glide” developed in her book and videos—are encountered in or speak from the Gap. Their glyphs are unrelated to the representational linear practices of fixed meaning speech in natural language writing systems. A sentient visual language glyph (see Glide below and paintings by Pin Li) engages in re-combinatory movements with other Glyph’s or unfolds within itself on the computer screen to reveal additional meanings. “...it is ... possible to create text-as-image that *simultaneously* insists on the continuing importance of embodiment to human perception and being. The trick is to do both at once, to work at the borderline between text and image, enduring material form and mutable cultural production, without sacrificing either to the other.”<sup>44</sup>

Using an invented sentient visual language a dynamic exploration of images and writings of the meaning revealed in the Gap emerging from the continuous unfolding flow between poetic knowing/speculative reason glyph systems. A sentient visual language may also be appropriate for exploring fractal art across multiple magnifications (see 3D Mandelbrot Set <http://www4.ncsu.edu/?zwoodst/mandelbrot.html> and for visualizing the interpenetrative geometry of space as Tessellation fractals. The continuous flow of Glyphs can be experienced as a maze that one dances through or as an extended metaphor as one Glyph unfolds itself into its’ glyph components much like a Chinese character does.

Glyph symbol interpretation by directly encountering the visualized flow can be enhance and interpreted while under the effect of an empathogen. Such a new observer’s perception can produce a shift in reality including the ability to analytically (as defined here) experience the symbolic deity of the plant and other entities. It can engage multiple realities (Shamanic, poetic, scientific and this reality) at the same time (everyday) as the “other” as depicted in a video or simulation. See the following very suggestive examples in Xenolinguistics (visualization of the Gap) <https://vimeo.com/16237247> and other examples.

eb4588cf-dfd7-49d8-972f-4fb5987c6e13

Image not readable or empty

<https://journal.emergentpublications.com/wp-content/uploads/2018/02/eb4588cf-dfd7-49d8-972f-4fb5987c6e13-300x148.png>

**SkinBridge** offers a means for investigation of the somatic reality of the Gap via somatic knowing. This involves a tattoo infused with plant ethnogenic substances on one's skin with somatic perception reinforced by the symbols as shown by the investigations of Caroline and Getan cottereau-maudree (<https://vimeo.com/34637969>)

a13b814b-4b0b-4e8f-b7dc-3ebb5a154544

Image not readable or empty

<https://journal.emergentpublications.com/wp-content/uploads/2018/02/a13b814b-4b0b-4e8f-b7dc-3ebb5a154544-300x129.png>

Fig. 8: Skin-bridge tattoos

## Concluding comment

I have attempted to describe a knowledge Gap that limits our ability to fully know the dynamic full here-and-now of an evolving object, process or event in space-time. This requires a new theoretical ontology-epistemology and set of tools, means of analysis, and expression that includes the refinement, even shifting of perception in unexpected ways as a means of analysis and for presenting findings. The performing or reading of sentient visual language when combined with productions of poetic knowing—surrealism for example—produces a result that "...is more than a cognitive activity—or rather, it is an activity that takes place in the embodied cognitions of a...subject who is made to realize anew the inextricable entwining of body with mind, image with text. We are the medium, and the medium is us."<sup>44</sup>

## Footnotes

\* Presented at the 2017 Society for Chaos Theory in Psychology & Life Sciences 27th Annual International Conference August 11-13. An earlier version was presented at the 2017 Annual Winter Chaos/Snowflake Conference Mercy College, Dobbs Ferry, NY, March 17-19, 2017.

<sup>1</sup> Note: my interest is not in reconciling Snow's<sup>45</sup> "two cultures" but in addressing how a more complete knowledge of the reality of complex systems might be achieved by overlapping and blending these ontologies and ways of knowing.

<sup>2</sup> The view taken in this paper is that Nothingness is the ground from which all arises. As such it is: "Naturally occurring timeless awareness—utterly lucid awakened mind—is something marvelous and superb, primordially and spontaneously present. It is the Treasury from which comes the universe of appearances and possibilities, whether of [this conventional world of enlightenment."<sup>46</sup>) In contradistinction to Heidegger where being is an overcoming of nothingness in the face of dread choosing to continuously recreate the self.<sup>47</sup> Heidegger: Being-There (or Nothing), <http://www.philosophypages.com/hy/7b.htm> )

3

<sup>4</sup> Recall that a McLuhan probe "...is a means or method of perceiving. It comes from the world of conversation and dialogue as much as from poetics.... [It] is discontinuous, nonlinear; it tackles things from many angles at once. [Our McLuhan probe should] be adapted to discovery and awakening perception and illuminating situations...."<sup>48</sup>

<sup>5</sup> Six evolving integrated temporal levels: virtual, nootemporal, biotemporal, eotemporal, prototemporal, and atemporal. The Borsuk-Ulam Theorem demonstrates their evolving topology.<sup>19</sup>

## Examples of 4-D fractals:

- [https://www.youtube.com/watch?feature=player\\_embedded&v=-7iFOGHmEQI](https://www.youtube.com/watch?feature=player_embedded&v=-7iFOGHmEQI)
  - [https://www.youtube.com/watch?feature=player\\_embedded&v=94jAa3jF7yk](https://www.youtube.com/watch?feature=player_embedded&v=94jAa3jF7yk) alternative 3D section of the 4D Julia Set fractal
  - [https://www.youtube.com/watch?v=sSR67nVwfFU&feature=player\\_embedded](https://www.youtube.com/watch?v=sSR67nVwfFU&feature=player_embedded) Julia set fractal animation 2
  - [https://www.youtube.com/watch?feature=player\\_embedded&v=-7iFOGHmEQI](https://www.youtube.com/watch?feature=player_embedded&v=-7iFOGHmEQI)
  - Julia set “core skeleton and solid” in fractals as 4 D objects.
- 
- <https://www.google.com/search?q=fractals+as+4+d+objects&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwiyzeCi9d3>
  - Holopoetry
  - <http://www.ekac.org/> and <https://www.youtube.com/watch?v=3LSJVD0m1Mg> inventor of holopoetry
  - Pentominoes standard set of shapes:  
<https://www.google.com/search?q=Pentomino+Shapes&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwiskfS1tOrPAhI>
  - Examples of fractal tessellations:  
<https://www.google.com/search?q=fractal+tessellation+definition&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjTI8C>

## References

1. Wilczek, F. (2016). *A Beautiful Question?* ISBN10: 0143109367 ISBN13.
2. Koehler, G. (2010). *Q-Consciousness: Where's the Flow?* *Nonlinear Dynamics, Psychology and the Life Sciences*, ISSN: 1090-0578, Vol. 15, Issue 3, July 2011. Pages 335 to 357.
3. Namgyal, D. (2001). *Clarifying the Natural State*, ISBN13: 9789627341451.
4. Michon, (2013)
5. Vacariu G., and Mihai Vacariu (2010). *Mind, Life and Matter in the Hyperverse*. Bucuresti: Editura Universitatii din Bucuresti. ISBN 978-973-737-827-9
6. Musser, G. (2017). *Spooky Action at a Distance*, ISBN13: 9780716703464.
7. Roob, A. (2016). *Alchemy & Mysticism*, ISBN13: 9783822886533.
8. Byrne and Callaghan, (2013)
9. Koehler, G. (2013). *Defining and Exploring a Complex System's Relational Spaces*. *ECO 2014* 16 (1).
10. Wohlmuth, P. (2001). *Infrastructure*. A video produced by the Institute of Law and Systems Research, San Diego University.
11. Slowik, E. (2010). *The Fate Of Mathematical Place: Objectivity and the Theory of Lived-Space from Husserl To Casey*, in *Space, Time and Spacetime*, *Fundamental Theories of Physics*, ISSN: 0015-9018, Volume 167, 2010, pp. 291-311.
12. Smolin, Lee (2014). *Time Reborn*, ISBN13: 9781846142994.
13. Lopez-Carra, et.al., 2012

14. Alexander, C. (2013) *The Nature of Order*, ISBN 0-972-65290-6, quote is from:  
[http://www.truthable.com/Fifteen\\_Principles.html](http://www.truthable.com/Fifteen_Principles.html)
15. Koehler, Gus (1998). *Inventing Biological Organisms*, at <http://www.library.ca.gov/crb/98/reader/reader01.pdf>
16. Kurzweil, R. (2017). *Accelerating Intelligence*, News (5-27-17). 3D-printed 'bionic skin' could give robots and prosthetics the sense of touch. [http://www.kurzweilai.net/3d-printed-bionic-skin-could-give-robots-and-prosthetics-the-sense-of-touch?utm\\_source=KurzweilAI+Daily+Newsletter&utm\\_campaign=e1de22f8c9-UA-946742-1&utm\\_medium=email&utm\\_term=0\\_6de721fb33-e1de22f8c9-281929453](http://www.kurzweilai.net/3d-printed-bionic-skin-could-give-robots-and-prosthetics-the-sense-of-touch?utm_source=KurzweilAI+Daily+Newsletter&utm_campaign=e1de22f8c9-UA-946742-1&utm_medium=email&utm_term=0_6de721fb33-e1de22f8c9-281929453)
17. Hayles, N. (1999). *How we became Post Human*, ISBN13: 9780226321462.
18. Helmreich, S. (1998). *Silicon Second Nature*, ISBN13: 9780520207998. *Infra-Mince*, [http://web.fm/twiki/bin/view/Hiaz/InfraMince\[10/6/2016 2:11:01 PM\]](http://web.fm/twiki/bin/view/Hiaz/InfraMince[10/6/2016 2:11:01 PM])
19. Koehler, G. (2016). *Temporal Space Mysteries of a Complex System: Performance in an Instant in Time*. Society for Chaos Theory in Psychology & Life Science, ISSN: 1090-0578, 2016 Annual Conference, University of Utah, Salt Lake City, Utah, July 29-31
20. Rabjam, L. (1998). *The Precious Treasury of the Way of Abiding*, ISBN 9781881847090.
21. Rosemont, F. (1976). *Freedom of the Marvelous a chapter in Marvelous Freedom: Vigilance of Desire*, World Surrealist Exhibition, Chicago 1976. p.5
22. Rosemont, F. (1989). *Now's the Time a chapter in Arsenal: Surrealist Subversion 2*. Chicago: Gallery Black Swan.
23. Koehler, G., Diane Rosen, and Pin Le (2017). *Private e-mails and conversations 1-2017 through 8-2017*.
24. Abraham, (2016)
25. Schulz, K. (2016). *Being Wrong*, ISBN13: 9780061176043.
26. Di Pippo, A. (2000). *The Concept of Poiesis in Heidegger's An Introduction to Metaphysics*. Thinking Fundamentals, IWM Junior Visiting Fellows Conferences, Vol. 9: Vienna 2000
27. Marcel Duchamp 1887-1968. <https://www.dadart.com/dadaism/dada/035a-duchamp-cage.html> An interview with Marcel Duchamp: "I believe that a picture, a work of art, lives and dies just as we do..." *The Art Newspaper*. Web only. Published online: 29 March 2013 <http://old.theartnewspaper.com/articles/An-interview-with-Marcel-Duchamp/29278>
28. Bateson, G. (1972). *Steps to an Ecology of Mind: Collected Essays in Anthropology, and Psychiatry*, ISBN 0-87668-950-0.
29. Coudert, and Forshaw (2005)
30. Aberth, S. (2010). *Leonora Carrington: Surrealism, Alchemy and Art*, ISBN13: 9780853319085.
31. Coudert, A. (1980). *Alchemy, the Philosopher's 'stone*, ISBN13: 9780394510484.
32. Gearin, A. (2017). *What Shamans, Alchemists & Physicists Have In Common*. Chacruna at: <http://chacruna.net/ayahuasca-shamans-chemists-physicists-common/>
33. Latour, B., and Woolgar, S. (1979). *Laboratory Life: The Construction of Scientific Facts*, ISBN13: 9780691028323.
34. Wood, C. (2009). E.H. Gombrich's 'Art and Illusion: A Study in the Psychology of Pictorial Representation' 1960, *Burlington Magazine*, December 2009.
35. Kuhn, T. (1962). *The Structure of Scientific Revolutions*, ISBN13: 9780226458045.
36. Hanegraaff, W. (2012). *Esotericism and the Academy: Rejected Knowledge in Western Culture*. ISBN13: 9780521196215.
37. Jung, (1952)
38. Kac, E. (1989). *Holopoetry and fractal Holopoetry: Digital holography as an art medium*. *Leonardo*, ISSN 1530-9282, vol. 22, no. ¼ 1989, pp. 397-402.
39. Kac, E. (1996) *Key Concepts of Holopoetry*, in *Experimental-Visual-Concrete: Avant-Garde Poetry Since the 1960s*. Edited by K. Davis Jackson, Eric Vost, and Johanna Drucker. ISBN13: 9789051839418
40. Volk, (1995)
41. McLuhan, M. and Carson, D. (2003). *The Book of Probes*, ISBN 9781584230564.

42. Rosen, D. (2013). Invoking the Muse: Dada's Chaos. Presented at the 23rd Society for Chaos Theory in Psychology & Life Sciences, 2013, ISSN: 1090-0578, Conference, Portland State University, Portland, Oregon.
43. Slattery, D. (2015). Xenolinguistics. ISBN13: 9781930846487.
44. Hayles, N. (2000). Visualizing the Posthuman. Critical Art Ensemble, ISBN: 9780956192882, Fall 2000.
45. Snow, C. (1959). The Two Cultures and the Scientific Revolution, ISBN13: 9780521065207.
46. Rabjam, L. (2001). A Treasure Trove of Scriptural Transmission: A Commentary on the Precious Treasury of Basic Space of Phenomena, ISBN 9781881847304
47. Kemerling, G. (1997). Heidegger: Being-There (or Nothing), <http://www.philosophypages.com/hy/7b.htm>
48. McLuhan, E. and W. Kuhns (2003). Poetics on the Warpath in McLuhan, M. and Carson, D. The Book of Probes, ISBN 9781584230564 (2003).
49. Ascott, R. (2003). Telematic Embrace: Visionary Theories of Art, Technology, and Consciousness, ISBN13: 9780585465913.
50. Bachelard, G. (1958). The Poetics of Space. ISBN13: 9780807064733.
51. Ball, P. (1999). The Self-Made Tapestry: Pattern Formation in Nature, ISBN13: 9780198502432. Retrieved from "[http://alotof.org/wiki/index.php?title=File:Ball\\_P.\\_The\\_self-made\\_tapestry.\\_Pattern\\_formation\\_in\\_nature\\_1999.pdf&oldid=1937](http://alotof.org/wiki/index.php?title=File:Ball_P._The_self-made_tapestry._Pattern_formation_in_nature_1999.pdf&oldid=1937)"
52. Barnsley, Michael (1988). Fractals Everywhere, ISBN13: 9780120790623.
53. Bateson, G. (1980). Mind and nature: A necessary unity, ISBN13: 9780006541196
54. Bigerelle, M., and Lost, A. (2000). Fractal dimension and classification of music. "Chaos, Solitons and Fractals," ISSN, 0960-0779 11(14):2179-2192 November 2000.
55. Boon, J. and Casti R. (2011). Artistic Forms and Complexity. "Nonlinear Dynamics, Psychology, and Life Sciences," ISSN: 1090-0578, Volume 15 No. 2. April, 2011 pg. 265.
56. Byrne, D. and Gill C. (2014). Complexity Theory and the Social Sciences, ISBN13: 9780415162968.
57. Chaotic System Demonstrations. <http://www.clausewitz.com/mobile/chaosdemos.htm>
58. Della-Bosca, D. and R. P. Taylor (2009). The Museum of Unnatural Form: A Visual and Tactile Experience of Fractals., "Nonlinear Dynamics, Psychology, and Life Sciences", ISSN: 1090-0578, Volume 13, No. 1. January, 2009.
59. Breton, Andre (1970). What is Surrealism? Franklin Rosemont, Editor, ISBN13: 9780904383287.
60. López-Carra, D. et. al. (2012). Space versus Place in Complex Human-Natural Systems: Spatial and Multi-level Models of Tropical Land Use and Cover Change (LUCC) in Guatemala, "Ecological Modeling", ISSN: 0304-3800 March 24, vol 229.
61. Radnitzky, G.; W. Bartley; K. Popper (1987). Evolutionary Epistemology, Rationality, and the Sociology of Knowledge, ISBN 13: 9780812690385.
62. Frankel, R. The Hypersphere from an Artistic point of View, <http://groups.csail.mit.edu/mac/users/rfrankel/four/FourDArt.html> [3/22/2016 4:34:23 PM]
63. Burkle-Elizondo, G. and Ricardo David Valdez-Cepeda (2006), Fractal Analysis of Mesoamerican Pyramids. Nonlinear Dynamics, Psychology, and Life Sciences, ISSN: 1090-0578, Vol. 10, No. 1, January, 2006. pg. 105 Fractals and Human Biology at <http://www.fractal.org/Life-Science-Technology/Publications/Fractals-and-Human-Biology.pdf>.3 downloaded 1:56, 10/16/2016
64. Goodwin, B. (2000). The life of form: Emergent patterns of morphological transformation. [http://doi.org/10.1016/S0764-4469\(00\)00107-4](http://doi.org/10.1016/S0764-4469(00)00107-4)
65. Gillespie, M. (2006). The Chaos and Complexity of Classic Hollywood Cinema. Nonlinear Dynamics, Psychology, and Life Sciences, ISSN: 1090-0578, Vol. 10, No. 1, pg. 123 January, 2006.
66. Giunti, R. (2003). Complexity Art. tout-fait. On-Line Duchamp Studies Journal ISSN 1530-0323. April 2003.
67. Goertzel, B. Staggering Half-Awake Along the Fractal Boundary of Melody and Noise, Trying to Wake Up a Bit. Downloaded 2/16/2017 at <https://www.youtube.com/watch?v=UJLhUAzNKFQ>
68. Goodhew, L. and D. Loy, 2002. Momo, Dogen, and the Commodification of Time. KronoScope, ISSN: 1568-5241, Volume 2,

69. Grosz, (2008). *Chaos, Territory, Art: Deleuze and the Framing of the Earth*, ISBN13: 9780231517874.
70. Harle, R.(2010). *Chaos, Archetypes, and the All-integrating Field*. *Nonlinear Dynamics, Psychology, and Life Sciences*, ISSN: 1090-0578, Volume 14 No. 1. January, 2010 pg. 101.
71. Kac, E. (1993). *Holopoetry, Hypertext, Hyperpoetry*. *Holographic Imaging and Materials*. Proc. SPIE 2043 (Bellingham WA: SPIE, 1993), pp.72-81.
72. Koehler, G. (1974). *Cosmology and Elite Democratic Theory*. Dissertation, Political Science Dept., University of California, Davis.
73. Lamp, L. (2016). *Aspects of the Element of Space in Art in two and three dimensions*. <https://www.sophia.org/tutorials/elements-of-art-space>.
74. Maritain, J. (1952). *The Range of Reason*. New York: Charles Scribner's Sons.
75. Maritain, J. (1944). *Poetic Experience*. *The Review of Politics*, ISSN, 0034-6705. Vol. 6, No. 4, pp. 387-402, October, 1944.
76. *The Mathematical Art of M.C. Escher* (2017). <http://platonicealms.com/minitexts/Mathematical-Art-Of-M-C-Escher/>
77. Merleau-Ponty, M. (1968). *The Visible and the Invisible*, ISBN13: 9780810118065.
78. Mitchell, K. (2015) *Mathematical Art Galleries*. <http://gallery.bridgesmathart.org/exhibitions/2015-bridges-conference/lkmitch>
79. Mitteroecker, Philipp (2009) *The Concept of Morphospaces in Evolutionary and Developmental Biology: Mathematics and Metaphors*, *Biological Theory* ISSN: 1555-5550, 4(1) 2009, 54—67.
80. Jing Huang, and Saya You (2016?). *Point Cloud Matching based on 3D self-Similarity*. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.670.9655&rep=rep1&type=pdf>
81. *3D Mandelbrot Set* <http://www4.ncsu.edu/~zwoodst/mandelbrot.html>
82. Nelson, (1980). *Science and Values: Arnold Brecht's Political Theory Revisited*. *Political Science Reviewer* Fall, 1980 - Vol. 10, No. 1 - See more at: <https://home.isi.org/science-and-values-arnold-brechts-political-theory-revisited#sthash.P37UM2Ng.dpuf> Downloaded 2-2-17, Intercollegiate Studies Institute, [https://isistatic.org/journal-archive/pr/10\\_01/nelson.pdf](https://isistatic.org/journal-archive/pr/10_01/nelson.pdf)
83. Nietzsche, F. (1966). *Thus Spake Zarathustra*. Translated with a preface by Walter Kaufman, ISBN13: 9780140047486.
84. Schroeder, M. (1990). *Fractals, Chaos, Power Laws*, ISBN13: 9780716723578.
85. *SCiArt*, <http://cargocollective.com/artscienceclimatechange/SciArt-The-confluence-of-art-and-science-in-conveying-the-uncertaintie> [12/29/2016 2:41:28 PM]
86. Slattery, D., <http://psychedelicsandlanguage.com/diana-reed-slattery/>
87. Taylor, R., et.al. (2005). *Perceptual and physiological Responses to the Visual Complexity of Fractal Patterns*. *Nonlinear Dynamics, Psychology, and the Life Sciences*. ISSN: 1090-0578, Vol.9, No. 1, January 2005.
88. *Visualizing the interpenetrative geometry of space as Tessellation fractals*. See: <https://sites.google.com/site/geometricarts/fractal-tessellation> <http://www.incredibleart.org/lessons/middle/tessell.htm> <http://www.hiddendimension.com/fractalmath/tessellationfractals.html>
89. Zausner, T. (2007). *Process and Meaning: Nonlinear Dynamics and Psychology in Visual Art*.
90. *Nonlinear Dynamics, Psychology, and the Life Sciences*, ISSN: 1090-0578, Vol. 11, No. 1, January, 2007, pg. 149.