

Imperfection as the foundation of life: the role of DNA in reality rendering.

Max Myakishev-Rempel

DNA Resonance Research Foundation, San Diego, CA, USA,

*Correspondence: MM, max@dnaresonance.org

Modern theories of consciousness often overlook the role of DNA. Yet evidence for genomic contribution to mind is undeniable. Consider that children look like their parents. Even those who never met their father inherit his facial features, thinking patterns and mannerisms. A sperm cell, containing largely DNA, transmits enough information to shape not just physical appearance but behavioral traits. The contribution of the genomic program to brain structure is also undeniable. And brain structure is absolutely essential for the work of the mind - when brain structure is damaged, as in lobotomy, personality changes radically.

Twin studies provide particularly compelling evidence. By comparing identical twins who are nearly identical in DNA sequence with fraternal twins who share only half their genetic variations, researchers can isolate genetic contributions. Studies of twins separated at birth are even more revealing - they share genes but not environment. These studies demonstrate DNA sequence determines 40-80% of many mental traits. For example, schizophrenia shows a heritability of 79%, meaning genetic factors account for 79% of the variation in risk across the population (73-85%) based on 31000 Danish twins (Hilker et al. 2018). The personality trait of novelty seeking shows heritability of 42% (41-45%) (Gillespie et al. 2003).

Therefore, the contribution of genetics to the work of the mind is very substantial. This does not exclude the important contribution of various fields discussed later in the chapter. The contribution of genetic information also does not exclude the possible overlay of information external to the body on top of genetic information to produce individual consciousness.

This chapter investigates the fundamental role of DNA in consciousness. This chapter will be followed by another chapter presenting the DNA sequence imprinting on water structure. Some information from there will be useful here, so I will summarize it briefly. In the next chapter (DNA imprinting on water structure), I will propose that DNA participates in perpetual chromatin reorganization through sequence-specific folding patterns. I will suggest that identical DNA sequences actively find and adhere to each other through water-mediated interactions, creating a dynamic molecular dance that serves as a form of cellular information processing. I will propose that this sequence-specific chromatin movement generates electromagnetic and electroacoustic interference patterns. Since DNA remains confined within nuclei, I will propose that these signals integrate across tissues through multiple mechanisms - classical wave propagation through electromagnetic and electroacoustic fields, diffusion heat transfer, quantum entanglement, and dedicated biological waveguides like neuronal and fascia fibers.

The nucleoplasm in the cell nucleus exists in a unique state between order and chaos - 1% DNA, 19% proteins, and 80% structured water. We will argue that this continuous flux between the formation and dissolution of structures is essential for life and is based on inherent molecular structure imperfections. This perpetually and dynamically self-restructuring DNA is perfectly structured and sized as a borderline interface between the microscopic domain of quantum uncertainties and the macroscopic domain of cells and tissues. Its electric charge and vibrational dynamics allow it to create and interact with the holographic morphic field, organizing body structures and participating in the brain's thinking processes. The ubiquity of DNA in the body and its stable genomic sequence allows it to serve as a living program that expresses itself via chromatin folding dance and the dance of the holographic field, bringing the morphic field's structuring influence into the organism's structure and mind. These morphic fields exert their influence mostly in living DNA because it carries the code and is in a state of perpetual reorganization, Figure [Sequence].

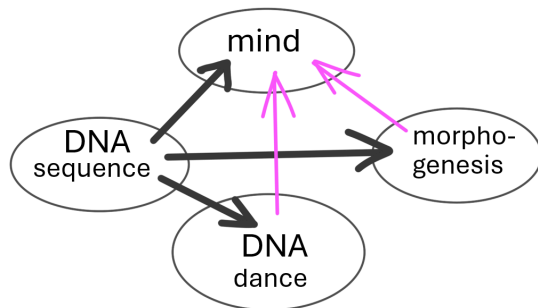


Figure [Sequence]. Contributions of DNA sequence and DNA dance (perpetual chromatin restructuring) to mind and morphogenesis (body shape). The thick black arrows are well established, the thin pink arrows are proposed here.

The dynamic balance between self-reorganization and chaotic decay is especially important in DNA in live tissue, as it the structures are labile allowing subtle influences of morphic field to produce substantial structural changes.

As I proposed earlier (V. Savelyev et al. 2019), in neurons, this model provides a direct link between DNA-based cellular thinking and neuronal firing patterns, expanding my model of neural computation to directly include DNA-sequence level processes. In my model, the genomic sequences in both the brain and body are vibrationally coupled and integrated into thinking processes, creating direct vibrational connections between the mind and the genome sequence.

Since DNA is separated from axons by a nuclear membrane, it is important to explain how the electromagnetic oscillations pass through that barrier. One explanation is that the mass of DNA of the body comprizes one vibrational holographic system that operates via electromagnetic and subtle waves that penetrate through nuclear and cell membranes separating the nuclei from each other. This mechanism was proposed by Miller and Web (R. A. Miller 1972; Richard A. Miller and Webb 1972, 2002) and I think this diffused resonance across the membranes is real and comprises the morphogenetic field of Gurwitsch (Gurwitsch 1922). In addition, I proposed an additional mechanism that DNA masses of the different cells neuronal nuclei communicate

with each other vibrationally via microtubules working as waveguides (V. Savelyev et al. 2019). The advantage of this mechanism is that it integrates well with the well established idea of neuroplasticity and synaptic transmission. It is well established that neuronal network in the brain is perpetually remodeled by growing and shrinking axonal branches and establishing and dissolving synaptic points of contacts. The majority of synapses are of a chemical type and a minority are electric. In the chemical synapses, the electric action potential comes to the synapse via the axon, is converted to a chemical signal that cascades via the synaptic gap into the target neuron. The target neuron is touched by thousands of axons via synapses and it integrates the incoming signals from multiple synapses to decide when to fire. In this classical mechanism is well established and is the basis of brain's function. In neuronal firing action potential is an electric polarisation of the axonal wall that travels along the axon. An additional signal transmission mechanism was proposed by Hameroff (S. R. Hameroff and Watt 1982) in which the signal travels inside the axon via microtubules as waveguides. Together with coauthors I proposed that DNA couples into this vibrational network via the nuclear membrane. By inspecting public microphotographs of the microtubules I noticed that they form a sphere around the cell nucleus on one end while the other end is extended into the axon (V. Savelyev et al. 2019). Therefore I suggested that DNA is vibrationally coupled with microtubules which form an electromagnetic antenna, Figure [Neuron].

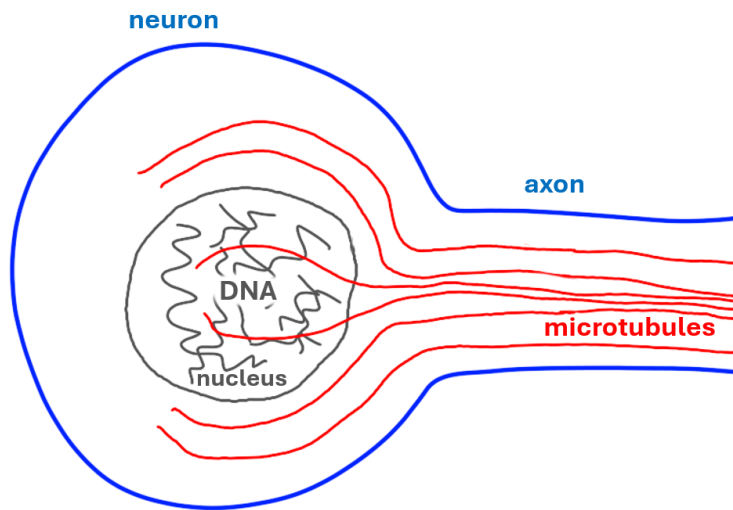


Figure [Neuron]. Proposed vibrational coupling of electromagnetic DNA and microtubule vibrations across the nuclear membrane.

Furthermore, serial electron microscopy demonstrated that the ends of the microtubules come close to the synaptic junction (Velasco et al. 2023). Therefore I suggest that electromagnetic signal travels from DNA via the nuclear membrane, microtubules - synaptic junction - microtubules of the other neuron - nuclear membrane - to DNA of the other neuron, Figure [Synapse]

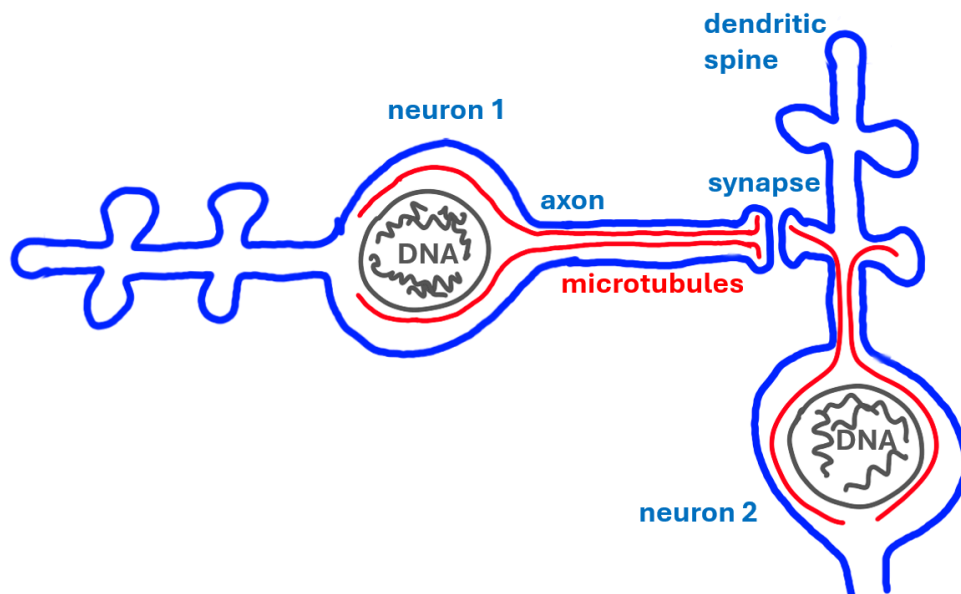


Figure [Synapse]. Proposed vibrational signal transmission between DNA masses of two neurons involving via microtubules and the synaptic junction. The microtubules (red) form a network around the nucleus and extend into the axon, serving as waveguides for vibrational coupling between DNA masses of different neurons.

Therefore, I propose that a combination of 3 types of signaling participates in thinking process:

1. "Firing". The classical neuronal firing,
2. "Field". A diffuse DNA hologram that acts as an electromagnetic and subtle field traversing membranes without resistance
3. "Waveguide". A microtubule-mediated vibrational network that connects DNA masses of neurons where microtubules act as waveguides.

The advantage of the "Waveguide" type of signaling is the topological directedness of the signal, it coincides with the neuronal network and evolves as this network continuously restructures. Also waveguides are efficient in preventing dissipation of the signal.

Similarly, I suggest that the fibers of fascia tissue serve as waveguides for DNA vibrations and this way the DNA mass of the whole body is vibrationally united into one network via fascia fiber waveguides. Thus the sequence-specific DNA dance vibrationally contributes to consciousness via microtubules and morphogenesis via fascia fibers.

The proposed vibrational coupling between DNA and consciousness links the evolution of mind with genomic evolution. This offers an explanation for why transposable elements and other non-coding sequences make up over 95% of the human genome. Classical evolutionary models cannot explain why these non-protein-coding sequences (unfairly labeled "junk DNA") are preserved through evolution. However, if these sequences serve as resonators in DNA-based holographic thinking, their evolutionary preservation makes sense.

This DNA hologram-mind connection supplements the well-established neural plasticity with chromatin plasticity and epigenetic memory as active participants in the work of the mind and memory as a novel mechanism. This aligns with emerging experimental evidence that epigenetic patterns, particularly DNA methylation, play an essential role in human long-term memory and addiction (Nestler and Lüscher 2019).

Mechanistic explanations serve well within their domain, but consciousness operates at the boundaries where reductionism fails. A substantial body of research explores these borderline phenomena. Understanding how the DNA hologram participates in the mind requires examining this evidence.

Quantum Physics

Quantum physics faces a fundamental puzzle: observation changes reality. A quantum particle exists in multiple states until measured - only then does it "collapse" into one definite state. Wheeler's delayed choice experiments show something even stranger - measuring a particle appears to retroactively determine its past behavior (J. A. Wheeler 1978). Multiple teams have confirmed this effect with increasing precision (Jacques, Wu, Grosshans, Treussart, Aspect, et al. 2007). And observation doesn't just alter the past - it also freezes the present. The quantum Zeno effect shows that continuous observation can lock a quantum system in place, preventing it from changing states (Itano et al. 1990; Gutiérrez-Medina, Fischer, and Raizen 2003). These are not mere oddities of measurement. They reveal that consciousness itself shapes physical reality, influencing not just the present but reaching backward in time.

Precognition

Consciousness involves decision-making in time, but time itself behaves strangely. A review of 90 controlled experiments with over 12,000 participants found people could anticipate random future events better than chance (Bem et al. 2015). Even more compelling - the body itself reacts to future stimuli. Analysis of 26 studies shows that heart rate and skin conductance change 2-10 seconds before randomly selected emotional pictures appear (Mossbridge, Tressoldi, and Utts 2012). This suggests an intriguing possibility - our conscious mind has evolved to limit the precognitive abilities that our bodies naturally possess.

Mind-Matter Interaction

Mind affects random and semi-random events. At Princeton's engineering laboratory, participants attempted to influence random number generators through focused intention. The effects were small but highly significant ($p < 0.0005$) (Jahn et al. 2007). Multiple independent analyses of similar experiments have confirmed these findings (Bösch, Steinkamp, and Boller 2006; Radin, Michel, and Delorme 2016). While the effects are subtle, their persistence across rigorous testing shows consciousness can shape physical reality.

Morphic Resonance

Morphic fields allow biological systems to share information across space. Sheldrake documented this through multiple experimental protocols (Rupert Sheldrake 2009): dogs know

when their owners begin returning home at random times (Rupert Sheldrake and Smart 2000), isolated plants coordinate their growth patterns (R. Sheldrake 1996), and humans sense when they are being watched, whether from behind through a window or via camera (Rupert Sheldrake 2013).

Sheldrake argues that it is not DNA but the morphic field that provides the shape for morphogenesis. I suggest that both effects take place: DNA sequence for sure contributes to morphogenesis, as shown by the twin and other studies mentioned above. But on top of that, I find it likely that the morphic field adds much additional morphogenetic information which evolves with time. This way, DNA might work not as the only source of structural (morphogenetic) information but more like a QR code, allowing it to retrieve information from the morphic field. Also, I believe, although with confidence, that the substantial mass of DNA in the body provides the medium to mediate this information retrieval from the morphic field via the DNA hologram and perpetual chromatin restructuring. The same principles relate to the creation of individual consciousness, with DNA contributing both as a chemical sequence and as a vibrational dancing hologram. I propose that this dynamic nature of the genome might act as a precisely tuned resonance structure, like a sophisticated antenna array that could detect and amplify subtle field influences. Here, the perpetual balance between order and chaos in chromatin organization creates the lability needed for sensitivity to subtle morphic influences. In that, the unique genomic sequence provides specificity, enabling each organism to receive specific morphogenetic and mental information from the morphic field.

Quantum Biology

Researchers have discovered that biological systems harness quantum effects in surprising ways. Research shows that plants use quantum coherence to achieve highly efficient photosynthesis (Engel et al. 2007), while birds appear to use quantum processes in their ability to navigate using Earth's magnetic field (Ritz et al. 2004), and similar quantum effects may operate in brain microtubules (S. Hameroff and Penrose 2014). These findings in mainstream biology journals suggest quantum mechanisms play important roles in living systems (Radin 2018).

Emerging quantum biology reveals experimentally that life is based on quantum effects. Plants achieve efficient photosynthesis through quantum coherence (Engel et al. 2007). Birds navigate Earth's magnetic field using quantum phenomena (Ritz et al. 2004). Quantum mechanisms in brain microtubules were proposed by (S. Hameroff and Penrose 2014). The main idea of this chapter is that life operates by hybridizing quantum and classical macroscopic domains, particularly through the perpetual self-organization of DNA, proteins and other macromolecular solutions. This aligns well with similar ideas of Radin and Ball that life is based on a fusion of quantum and classical domains (Radin 2018; Ball 2018).

I will now mention several theoretical works that reconcile quantum phenomena with biological processes. The biofield hypothesis (Rubik et al. 2015; Savelev, Miller, and Myakishev-Rempel 2022) proposes that measurable electromagnetic and quantum fields guide biological organization. Morphic field theory (Rupert Sheldrake 2009) suggests biological systems utilize field-like properties to coordinate development and behavior. At the cellular level, Jibu and

Yasue proposed quantum brain dynamics to explain how quantum processes operate in neural tissue (Jibu and Yasue 1995). Hameroff and Penrose suggested quantum computation occurs in microtubules through their orchestrated objective reduction theory (S. Hameroff and Penrose 2014).

Psi research

The evidence for quantum effects in biological systems demonstrates that living organisms operate through quantum phenomena. The quantum realm represents one clear boundary where classical laws are breached. Consciousness represents another such boundary - yet carefully designed experiments and observations demonstrate definitively how classical physical laws are transcended.

Remote viewing research provides compelling evidence for the nonlocal properties of consciousness. Government studies demonstrated accurate descriptions of distant targets under double-blind conditions by select trained remote viewers. The effect sizes, though modest ($d=0.20-0.33$), achieved extraordinary statistical significance ($p < 10^{-10}$) (E. C. May and Marwaha 2017). Independent verification confirmed these findings weren't due to chance, with combined statistics showing odds of 1 in 5 million against random occurrence ($z = 5.2$, $p = 10^{-7}$, a z-score of 5.2 over five standard deviations from the mean is very significant), (Utts 1995).

Additional confirmation of nonlocal properties of consciousness comes from cardiac arrest survivors whose consciousness continued functioning during documented brain inactivity. The AWARE study revealed that 39% of resuscitated patients (140 out of 360) reported conscious experiences during their arrest. Most striking were cases where patients accurately described specific events and conversations they could not have perceived through normal means (2 out of 101 patients with detailed sensory recall) (Parnia et al. 2014). This finding aligns with a larger study where 18% of cardiac arrest survivors reported typical detailed near-death experiences, with 12% providing highly detailed accounts verified by medical staff (van Lommel et al. 2001). These accounts often included accurate descriptions of medical procedures and conversations from apparent vantage points above their bodies, details later confirmed by hospital personnel (van Lommel et al. 2001). This suggests that although individual consciousness clearly develops in the body, it can dissociate from it in near-death circumstances.

Collective witnessing of transcendent perceptions accompanying a person's death is compelling since they have multiple witnesses. In a study of 480 cases, multiple individuals present at deaths simultaneously reported identical transcendent perceptions, with specific details matching across independent accounts (Moody 2011).

Further evidence that consciousness transcends the physical body comes from well-controlled mediumship research. Clinical investigations of mediums document cases where individuals demonstrate access to verifiable information about deceased persons unknown to them. In a rigorous study of 119 mediums, 77% provided accurate, verified information about deceased individuals [$p < 0.01$], with 38% demonstrating skills and abilities not present in their normal state (Moreira-Almeida, Neto, and Cardeña 2008).

Spirit possession occurs when an individual's personality appears to be temporarily replaced by a different personality, often accompanied by changes in voice, mannerisms, and behavior. The person may speak languages they never learned or display knowledge they could not have acquired normally. Unlike fraudulent simulation, genuine possession cases show consistent physiological changes that can be measured. Cross-cultural studies have documented spirit possessions across multiple societies, with subjects exhibiting distinct physiological changes, including alterations in voice, facial expressions, and autonomic responses. In controlled studies, independent medical observers showed strong agreement in identifying genuine possession states from normal consciousness or theatrical performance - 95% of the time, they made the same assessment, with statistical tests confirming this wasn't due to chance ($p < 0.001$). Documented physiological changes included dramatic shifts in voice frequency ($p < 0.001$), more than triple the baseline skin electrical conductance ($p < 0.01$), significant changes in heart rhythm patterns, and distinct facial muscle activation signatures. These objective biological changes were remarkably consistent whether studying spirit possession in Uganda (119 cases, 85% showing all defining characteristics) or mediumship practices in Brazil (110 cases, 81% showing all defining characteristics). Importantly, these changes occurred in stereotyped patterns across different cultures and geographical regions (van Duijl et al. 2010). From the spirit possessions, we can conclude that the individual consciousness not only can disconnect from the body in which it developed but also it can temporarily possess (occupy) another genetically unrelated body.

In the consciousness research we reviewed so far the information was coming from outside. Now let's mention the studies where people can affect external events remotely. The Global Consciousness Project has monitored random number generator networks during major world events since 1998, documenting significant deviations during events like 9/11, with odds against chance exceeding a trillion to one (Nelson 2002). Group meditation studies have demonstrated measurable effects on electronic random number generators, showing consistent patterns across 13 experiments ($p < 10^{-4}$) (Radin, Michel, and Delorme 2016). Large-scale meditation assemblies correlated with measurable decreases in regional crime rates - a 13% reduction across 48 cities when group size exceeded the square root of 1% of the city population (for ex. 100 meditators per 1 million city), (Dillbeck & Cavanaugh, 2016).

In all mentioned literature, although the effects are small, due to large numbers of observations, and use of good controls, they are statistically significant. Thus there is evidence for remote nonclassical information transfer from afar to the individual mind and nonclassical influence of minds on the outer events. In rare cases under boundary circumstances, the individual consciousness can detach from the body where it originated and either experience outer events from the new position as in NDE cases, temporarily possess another body, or its transcendent projection be perceived outside the body by multiple witnesses. Later in the chapter we will refer to these studies as Psi studies and explore the role of DNA and brain in cocreating the mind.

Universal consciousness

Science revives the ancient idea of primacy of universal consciousness.

Schrödinger argued for a unified universal consciousness, noting the peculiar fact that while we perceive consciousness as fragmented into many individual minds, the actual evidence points to a singular awareness. He points out that consciousness always appears in the first person - we never directly experience it as plural. This led him to propose that separate consciousnesses are an illusion, and that all minds are aspects of one universal consciousness. Just as physics revealed that matter consists of shared universal fields, Schrödinger suggested consciousness too might be a unitary phenomenon that only appears individuated (Schrödinger and Barbour 1959).

David Bohm proposed that physical reality emerges from a deeper universal field (the implicate order, similar to a concept of morphic field and universal consciousness). His key insight was that both matter and mind emerge from this same conscious source. The physical objects (explicate order) are manifestations of an underlying universal intelligence (Bohm 1980).

Rupert Sheldrake's theory of morphic resonance proposes that information patterns are inherent in nature, with similar structures and behaviors resonating across time and space. This implies a form of universal consciousness field that shapes biological and nonbiological systems, influencing their development and behavior (Rupert Sheldrake 2009). Sheldrake's work suggests that morphic field contains cumulative information from past similar systems, suggesting that complex behaviors and structures emerge without being fully encoded in DNA.

Ervin László proposes that consciousness is intrinsic to the cosmos through what he terms the "Akashic field" - a fundamental information-carrying field that permeates all of space-time. Unlike theories that view consciousness as emerging from brain activity, László argues that consciousness is primary and inherent in the universe's fabric. He suggests that Akashic field stores and conveys all information about the cosmos, past and present, serving as a universal memory bank that connects all things and minds. Through this field, individual consciousnesses are connected to each other and to the universal consciousness, making individual consciousness a localized expression of a universal field. The brain acts as a receiver, filter, and processor of information from the Akashic field (Laszlo 2007).

Radin views universal consciousness as a fundamental aspect of reality underpinning space-time itself. He argues that telepathy, clairvoyance, precognition and psychokinesis emerge naturally from this universal consciousness - phenomena that were once considered magical but have been repeatedly demonstrated in controlled experiments. In Radin's perspective, the universe is inherently conscious and informational, with humans innately capable of experiencing these abilities when not inhibited by cultural conditioning (Radin 2018).

Hameroff and Penrose argue for consciousness as fundamental to the universe through their Orchestrated Objective Reduction (Orch OR) theory. They propose that consciousness isn't produced by the brain but rather exists as a basic feature of spacetime geometry at the quantum level. In their view, the brain doesn't generate consciousness but rather "tunes into" or accesses this fundamental property of the universe through quantum processes in microtubules. This places consciousness not as an emergent property of neural activity but as an intrinsic feature of reality itself, with the brain serving as an interface to this deeper quantum level of existence (S. Hameroff and Penrose 2014).

I argue that literacy in evidence-based science, particularly in quantum physics and Psi research, inevitably leads to the revival of the concept of universal consciousness.

Placing DNA in the context of universal consciousness

I already mentioned my idea that DNA in a dual form of a substance and dancing hologram is an important addition to dancing electric charges in neuronal networks of the brain to create the individuation of consciousness. Here I will expand a bit to emphasize the material presence of DNA in the body. The total weight of DNA in the body is about 250 grams. The body contains about 30 trillion cells, each containing 6 billion base pairs that correspond to 1.5 Gigabytes of information per cell. Although primary DNA sequences in cells are nearly identical, each cell has a unique pattern of DNA methylation and three-dimensional perpetual dynamic chromatin folding. Thus the information content and information processing capacity of chromatin-based computation in the body is exceptionally high. Note that computation that I argue happens via perpetual chromatin dance has both properties of logic and intuition. The logic is discrete and comes from DNA sequence-specificity of folding and intuition comes from its dancing hologram properties based on electromagnetic, acoustic and other fields. As we argued above, coupling this DNA dance with the dance of electric charges in neuronal networks of the brain we suggest creates a mechanism of individuation of the universal consciousness. We will keep expanding this idea further in this chapter and the following chapter.

Reality rendering principle

Here, I expand my model to suggest that individual consciousness emerges from universal consciousness by filtering through DNA and neuronal networks. I propose that individual consciousness constructs its experience of reality moment by moment as we move through it, similar to how video games render only the immediately visible environment while maintaining agreement with the broader picture of the physical world. This perspective aligns with several prominent theorists who have developed models of individual reality rendering.

Donald Hoffman provides a model of reality rendering through his interface theory of perception. Using evolutionary game theory and mathematical modeling, he demonstrates that organisms evolved to see what he calls a "species-specific desktop" - a useful interface rather than objective reality. Just as a computer's desktop icons serve as functional shortcuts rather than showing the actual electronic processes, our perceptions of space, time, and physical objects are simplified interfaces shaped by evolutionary fitness rather than accurate representations of underlying reality (D. Hoffman 2019; D. D. Hoffman and Prakash 2014).

Karl Pribram's holonomic brain theory suggests reality is reconstructed through holographic principles, where the brain processes interference patterns to create our experiential world. Like a hologram, each part contains information about the whole, explaining how memories and perceptions remain intact even with substantial brain tissue loss (Pribram 1991, 1987).

David Bohm's model proposes physical reality continuously renders (unfolds) from a deeper implicate order. While he doesn't use rendering terminology specifically, his concept of reality

emerging from a deeper order through a process he called "enfoldment" aligns with modern rendering concepts (Bohm 1980; Bohm and Hiley 2006).

We will use this reality rendering principle briefly reviewed above as the core principle in our Frare model of consciousness.

Fractality

The concept of "as above, so below" dates to ancient philosophical traditions, but its scientific exploration began with early 20th-century discoveries of self-similar patterns in nature. D'Arcy Thompson's 1917 work "On Growth and Form" demonstrated how mathematical principles and similar patterns appear across different scales in biological structures (Thomson 1917).

In 1972, Richard Alan Miller and Burt Webb proposed their embryonic holography concept, suggesting a fractal-like process of biological development where DNA information guides organization across multiple scales. Their model proposed that the body develops through holographic principles, with each part containing information about the whole (Richard A. Miller and Webb 1972, 2002).

The mathematical framework for understanding these patterns emerged in the 1970s when Benoit Mandelbrot introduced fractal mathematics, showing how self-similarity characterizes many natural structures - from coastlines to tree branches. His work provided mathematical tools for describing patterns that repeat across different scales (Mandelbrot 1982).

In the 1980s, researchers discovered fractal patterns in DNA sequences, finding self-similar repetitions at different scales in both coding and non-coding regions (Peng et al. 1992). Throughout the 1990s, advances in chaos theory and complex systems revealed fractal patterns in brain activity. EEG recordings showed self-similar patterns across different time scales, suggesting consciousness operates through fractal dynamics (Pritchard 1992). Building on these findings, Karl Pribram expanded his holographic brain theory to incorporate fractal principles, suggesting consciousness emerges through self-similar patterns of neural activity across multiple scales (Pribram 1991).

Quantum biologists have found fractal patterns in coherent energy transfer within cells. Mae-Wan Ho's work showed how organized water in cells creates fractal networks that maintain quantum coherence at physiological temperatures (Ho 2008). Giuseppe Vitiello developed a quantum field theory of brain function, suggesting consciousness emerges through fractal-like organization of quantum processes across multiple scales (Vitiello 2001). Stuart Kauffman's work on the origins of order suggests that life itself emerges through fractal-like self-organizing processes, with similar patterns of organization appearing from molecular to organismal scales (Kauffman 1993). These findings converge with Walter Freeman's studies showing how brain dynamics exhibit self-similarity across temporal and spatial scales, suggesting consciousness might operate through nested hierarchies of fractal patterns (Freeman and Breakspear 2007).

The work from the Barabasi lab shows that cellular networks, from metabolic pathways to gene regulation, follow fractal-like scale-free patterns (Barabási and Oltvai 2004). Hameroff and Penrose, in their work on quantum processes in microtubules, suggest that consciousness

emerges through the fractal-like organization of quantum effects, from molecular to cellular to brain-wide scales (S. Hameroff and Penrose 2014).

We will include fractality as another core principle in the Frare model.

Frare model

To integrate DNA into the model of consciousness, I outline here a model that I nicknamed Frare after FRActal REnDerIng. The model combines fractality with reality-rendering principles to explain the role of DNA in consciousness. However, since I will introduce several additional components that go beyond FRActal REnDerIng, the model's nickname should not be interpreted as its complete definition.

Consider an analogy of reality being rendered moment by moment, frame by frame. If the frames flick fast enough, then the latest ones represent a present moment. As the frames move to the past, there is a process of generalization and forgetting that keeps only general trends and conclusions but not the whole video. This aligns with Hoffman's interface theory, where perception is actively constructed rather than passively received (D. Hoffman 2019), and with Pribram's holographic model, where reality is continuously reconstructed through interference patterns (Pribram 1991).

This frame-by-frame rendering raises a paradox: if each person constructs their own reality, how do we share one coherent world? How can multiple observers with free will co-create reality together?

Multiplayer computer games offer a useful analogy. Each player's computer renders only what that player experiences, yet all players share a coherent game world. This is achieved through the synchronization of individual experiences. Likewise, in the real world, each consciousness renders its local perspective while maintaining coherence with the collective experience. This explains how the individual rendering of reality can coexist with shared experience.

Imperfection and consciousness

Reality, whether at the individual or collective level, is not perfect or fully coherent. At its core, the physical space-time fabric shows distortions that deviate from classical laws. Time and space, when pushed to extremes, deviate from classical laws - that happens at microscopic scales, high energies, or near the speed of light. Beyond the physical domain, Psi phenomena such as possession, out-of-body experiences, retrocausality and observer's effects further challenge classical laws. These anomalies indicate that the classical world is merely a special case, contingent on conditions that allow it to appear coherent to individual minds.

The Frare model suggests that these anomalies - imperfections are not exceptions but are, in fact, fundamental, unavoidable and necessary aspects of reality's design. Gödel's incompleteness theorems demonstrate that no system can be both complete and consistent; any system of rules will inevitably contain truths that it cannot prove. In the same way, our perception of reality is inherently incomplete, filled with contradictions that cannot be fully resolved (Gödel 2006).

This fundamental role of imperfection is captured in the physicist's joke: Einstein passes away, meets God and asks for a unified theory of everything. God obliges. After some contemplation, Einstein points out an error. God smiles knowingly and replies, "Yes, I know."

Robert Laughlin reframes the role of imperfection by suggesting that the laws of nature are not fundamental and fixed but rather emergent properties shaped by the interactions within complex systems (Laughlin 2005). He argues that the pursuit of a perfectly unified theory is fundamentally flawed because the rules we observe are not immutable absolutes but context-dependent, adapting to specific conditions. Reality, in this view, is not a static puzzle with a single solution but a dynamic, evolving process. The apparent inconsistencies and imperfections we encounter are thus not flaws but essential characteristics of an adaptive system.

Rupert Sheldrake provides empirical evidence that even the supposedly constant laws of nature show subtle variations over time (Rupert Sheldrake 2012). His analysis of historical scientific measurements suggests that physical constants, rather than being truly constant, display small but measurable changes. This observation adds another dimension to reality's inherent imperfection - even its most basic regularities appear to drift and evolve.

Thomas Kuhn's analysis highlights that individuals and societies maintain self-contradictory worldviews. In *The Structure of Scientific Revolutions*, he highlights how scientific paradigms persist despite accumulating contradictions, as scientists often dismiss or ignore anomalies that do not fit the prevailing framework (Kuhn and Hawkins 1963). This behavior is not confined to science but reflects a broader human tendency to overlook discrepancies maintaining an illusion of coherence even in the face of conflicting evidence.

Despite the inherent imperfections and inconsistencies in how reality is constructed, individual minds are remarkably oblivious to these flaws. In an individual mind, the flow of circumstances is rendered on demand, much like a video game generating only the immediately visible scene. Although the combined picture is riddled with inconsistencies and gaps, the mind has evolved to selectively ignore contradictions, allowing for a seemingly coherent experience. Modern humans have adapted to navigate conflicting cultural paradigms by fracturing the mind, compartmentalizing social roles and shifting seamlessly between them based on context, often without even noticing the shifts.

At a collective level, this selective focus becomes even more pronounced. Diverse minds co-create overlapping but not fully consistent versions of reality, enabling societies to overlook contradictions to maintain cohesion. This collective disregard for inconsistencies allows different groups to coexist despite fundamentally opposing beliefs, though it often leads to friction and creative conflict that can drive progress.

Autonomy of reality rendering

It's difficult to imagine how the vast universe could be meticulously orchestrating itself just to craft dramatic personal experiences for each individual - such an approach seems computationally inefficient. Instead, I propose that these experiences are rendered

autonomously, shaped by each person's thoughts, beliefs, neuronal network structure, and their body's dynamic DNA hologram. Rather than being directed by a grand cosmic conspiracy, the individual experience is co-created through the synthesis of personal and collective genetic patterns, ideas and vibrational fields. In this model, the dynamic refolding of the genome and the dance of the vibrational DNA hologram serve as an interface between the individual mind and the remainder of the universal consciousness, with the DNA hologram actively participating in the co-creation of experience.

Given the fractal, convoluted and interconnected nature of the collective reality matrix, where everything is linked to everything across space and time, ancestral connections likely play a significant role. The human population carries approximately 100 million genetic variations and, largely in the repetitive regions, comprising about 3% of the genome (counting point and structural variations). As the number of ancestors doubles each generation, each individual shares progressively fewer of these variants with each of their ancestors across generations - 50% with each parent, 25% with each grandparent, 12.5% with each great-grandparent, and so on. The total number of individual's inherited variations stays approximately 100% in each generation but is progressively divided among a larger number of ancestors. Based on this genetic variation and inheritance pattern, I propose two modes of collective DNA resonance. The variable 3% of the genome that differs across the population and is inherited from the ancestors - these variable regions resonate in a DNA-sequence-specific manner across time with ancestors, producing information flow within the genetic lineage and transferring morphogenetic (body shape), health and cultural information.

Meanwhile, the conserved regions, covering the remaining 97% of the genome, are shared universally among all humans and facilitate resonance with the whole of humanity in the present time and across time. This suggests two modes of DNA sequence-specific vibrational, informational, and health integration: one with ancestors-descendants and another with humanity as a whole. This model expands on Sheldrake's idea of the morphic field by specifying DNA resonance connections. Testing resonances through time is difficult since it is harder, but testing DNA resonances among model biological systems having unique DNA sequences is quite feasible. I predict that substantial changes induced in some treated model organisms would affect genetically related organisms in a sequence-specific manner.

Automatic self-defense of illusion

In paranormal research, there are many anecdotal stories where paranormal phenomena would fail to reproduce in the presence of skeptics. As we learn from the successful Psi experiments of Radin, Sheldrake, the Global Consciousness Project, Monroe Institute and other pioneers of Psi research, special experimental designs are required to avoid the negative effects of skeptic observers. This suggests that the law of preservation of illusion is among the fundamental laws of the universe.

In "Synchronicity: An Acausal Connecting Principle" (C. G. Jung 1952), Jung documents how coincidences maintain their ambiguous nature through a trickster-like pattern - arranging themselves to allow rational explanation even against astronomical odds. The phenomena demonstrate a peculiar interdependence between objective events and the psychic states of

observers, systematically preserving what Jung terms "the possibility of doubt." Writing about apparitions and precognition, Jung further shows how paranormal phenomena actively generate uncertainty by manifesting in ways that prevent definitive proof, maintaining an inherent factor of doubt that ensures space for skeptical interpretation (C. G. Jung 1963).

This suggests that the reality matrix operates in a manner of an archetypal liar, such as the Wizard of Oz or the Nordic god Loki. For every deviation from the norm, an elaborate set of illusions is rendered to explain away the anomalies. In the Frare model, I suggest that this rendering of elaborate scenarios and concealment of inconsistencies occurs automatically through neurophysiological and DNA holographic mechanisms. This deception is a natural consequence arising from the properties of spacetime and the evolutionary development of the human mind, optimized for survival through rapid processing and problem-solving. I will develop this idea further by exploring the emergence of experiences of time drag and free will.

Free will and the illusion of time drag

The phenomenon of making choices and free will is closely connected to the experience of time. Although the term "linear time" is frequently used for the description of compulsory time progression, it is inadequate since linearity misses the point of the compulsory nature of time progression. Therefore, I introduce the term "time drag" instead to emphasize the compulsory nature of time progression when it relates to human (and animal) experience. Introspectively, we can divide time perception into two distinct modes: time drag and time wandering. Time drag is compulsive and is associated with immediate, moment-to-moment perception and physical experiences that require attention. In contrast, the second mode of time experience can be called time wandering, which allows wandering and shifting across the past and future while daydreaming. It involves wandering via memories and future possibilities.

As mentioned earlier, systematic experiments and observations challenge the notion of time drag. Wheeler's delayed-choice experiments demonstrate that quantum events can be influenced by future measurements. Photons appear to retroactively decide their path based on choices made after they have already "chosen" a path (Jacques, Wu, Grosshans, Treussart, Grangier, et al. 2007). Similarly, the quantum Zeno effect shows that continuous observation can freeze the evolution of quantum systems, implying that time flow might depend on observation rather than being absolute (Itano et al. 1990). In Psi research, meta-analyses of precognition studies have found significant effects indicating that individuals can obtain information about future events (Bem et al. 2015). Studies on physiological anticipation show that human physiology can respond to future stimuli seconds before they occur (Mossbridge, Tressoldi, and Utts 2012). The ability to see the future (clairvoyance) is reviewed in (Radin 2018). Is this ability genetically determined, or is it suppressed by cultural factors? While most individuals in controlled studies demonstrated some level of psychic ability, it was only a small subset who consistently failed to do so (Radin 2018, 2024). So, there are many humans with undeveloped clairvoyance. From that, I conclude that it is culture that is responsible for such repression. Developing this further, I suggest that clairvoyance is repressed by cultural evolution driven by competition.

Historically, the suppression of clairvoyance and intuitive abilities accompanied the rise of societies focused on warfare and technological dominance. David Graeber and David Wengrow offer evidence and argue that it is only recently that the patriarchal, hierarchical type of society achieved exclusive dominance (Graeber and Wengrow 2021). They demonstrate that until recently, there existed two types of culture: patriarchal (war-oriented, hierarchical and logical) and matriarchal (more peaceful, egalitarian and intuitive). Patriarchal societies systematically diminished cultural traits that could interfere with immediate goal pursuit - not just clairvoyance but also ecological awareness, empathy, and heart-centered perception. Intuitive thinking was confined to narrow domains like religion and art, removing it from daily decision-making. By enforcing individual consciousness locked into time drag, these societies enhanced their ability to coordinate large populations and outcompete rival societies. This cultural shift toward time-dragged consciousness proved remarkably successful in promoting predictability, control, technological advancement and competitive dominance.

A remarkable illustration of this cultural repression of psi abilities is presented by a recent documentary podcast, "The Telepathy Tapes" by Ky Dickens, with the participation of Diane Hennacy Powell, Rupert Sheldrake, and Dean Radin (Dickens 2024). It documents that many nonspeaking autists demonstrate exceptionally high precision of telepathic connection to their mothers after learning to type. This ability for telepathy and other psychic gifts comes at a price of speech and integration into society. These and many other cases illustrate that psychic abilities are culturally repressed in people to protect their minds from the influx of unfriendly telepathic and empathic currents in modern competitive society.

Modeling free will

Although taking seriously quantum physics and Psi research leads us to question the reality of time, attempting to treat time as purely illusory creates a paradox - we cannot deconstruct time without simultaneously deconstructing space, as are inseparable in our time-space universe.

To learn more about time drag and consciousness, let's look at the modeling of free will. A subject with complete information about all possible outcomes and sufficient computational capacity would make inevitable choices. True free will requires both limited information and time pressure (the fear of approaching a deadline) - the person must be under time drag to make free-will decisions.

Interestingly, in computational modeling of free will, it is impossible to get rid of time and time drag. To model time, one has to introduce an additional temporal dimension (time²) for the observer's perspective. The observer must operate outside the subject's timeline to analyze the decision process.

A good example of computerized modeling of free will is a self driving car such as Tesla. It has to make decisions under time pressure and even if it has multiple choices, it has to make one before it is too late. For example, if a middle lane has stopped but there are free lanes to the right or left, it has to choose one or another and it does choose. Sometime the choice is purely random, but in other times many factors are taken in consideration, so this choice resembles

free choice by a human very well especially as the performance of autopilot outperforms 88% of humans (Abdel-Aty and Ding 2024).

How much can the computational system be simplified to remain a good model of free choice by humans? Apparently, this similarity is not discrete (similar, different) but is characterised by extent. In some cases people make free choices at random, resembling a random number generator such as flipped coin, in other cases people make choices purely algorithmically, without much freedom. To resemble a human free choice, the system doesn't even have to be an electronic computer. A good example of a noncomputerized free choice system is a "bump-n-go" toy car that became popular in 1970s. It would go straight until it would hit an obstacle, then it would turn the wheels automatically and reverse trying to find a free path and once a free path was found it would go straight again. So the process resembled human contemplation and trial and error method of making choices. Note that these artificial machines and random number generators all operate under time pressure. They differ from people in the extent of contemplation and complexity of the understanding their environment, having in mind a simplified mental model of the environment, and mental weighing the potential outcomes. As long as computers have random number generators embedded in the algorithm, they are not in principle much different from humans in making free choices under time pressure and can outperform humans as they did in chess and self-driving.

The neuronal and metabolic basis of time drag

In the Frare model, experiences are synthesized through the brain and a DNA hologram. Let's use this to look for the mechanistic basis of the time drag experience. The main feature of the time drag experience is its asymmetry in time.

Therefore, in the search for time drag experience, we need to look at brain function and neuronal and chemical processes. Although Hameroff proposed that wavefunction collapses in microtubules are responsible for the experience of time (S. Hameroff and Penrose 2014), and I previously proposed that wavefunction collapse in DNA is responsible for the experience of time (V. Savelyev et al. 2019) - both these collapses don't seem to have obvious time asymmetry. In search of time asymmetry, we noticed two most notable asymmetries - neuronal firing and cellular respiration. In neuronal firing, the action potential (a rapid change in electrical polarization of the membrane) propagates along individual neurons in one direction. In sensory neurons, it typically moves from the periphery towards the central nervous system. In motor neurons, it moves from the central nervous system towards the periphery.

The brain's role in creating our experience of time drag is demonstrated through studies of the basal ganglia and dopamine system. Patients with Parkinson's disease, which disrupts dopamine signaling in the striatum, often report distortions in their perception of time's passage - moments can seem to stretch endlessly or compress unpredictably. The striatum acts as a timekeeper, using patterns of dopamine release to mark out the rhythm of the time progression experience (Meck 1996). The hippocampus, prefrontal cortex and cerebellum integrate and coordinate the experience of time progression (Meck 1996).

Patients under general anesthesia report experiencing no passage of time and awakening with no sense of time period during anesthesia. Anesthetics achieve this effect by disrupting synchronized neural activity across brain regions, particularly affecting thalamocortical circuits that help generate conscious awareness.

Not only humans but also animals experience time drag and make choices. This is clearly visible when cats and dogs think before making choices and when they make mistakes upon contemplation. Even more fascinating, single-cell organisms with no brain or neurons show sophisticated learning and decision-making. This is evident from microscopic videos of white blood cells hunting bacterial cells or the single-celled eukaryote *Paramecium* doing the same. Another example is the mating dances of the single-celled eukaryote *Physarum*.

But how can an organism without a nervous system think? My model suggests that the dynamic folding of chromatin itself provides logical thinking and intuition. I suggest that the intuitive component comes from the morphic properties of the field affecting the self-structuring dance of chromatin. As I suggested above, in higher organisms, this chromatin-folding thought process merges with neural processing - creating a system where both DNA hologram and electrical neuronal activity participate in the thought process and making choices under time pressure.

The timeline branching problem

The combination of free will and time drag creates a theoretical timeline branching problem. If each moment of choice spawned new timeline branches, the number of possible futures would quickly multiply. This seems intuitively wrong.

I suggest that this branching is resolved in nature as it is resolved in our mind - uninteresting scenarios are forgotten, fade away and are swept under the carpet. I suggest that timeline branching occurs in discrete episodes. Between these decision points, retrocausal effects help collapse the multiplicity of possible outcomes toward archetypal patterns - what I term "storyline attraction." As demonstrated by Campbell's Hero's Journey pattern across cultures (Campbell 1949), while individual choices remain free, events tend to conform to archetypal collective plot templates.

The maximization of drama

Moreover, as timelines branch with every decision, I suggest that they also collapse. This collapse aligns nicely with the Mandela effect (Prasad and Bainbridge 2022; French 2019). I suggest that timelines constantly collapse as the attention of the universal consciousness is attracted by drama and shifts towards maximum dramatic charge. So, the timelines collapse to the most dramatic scenarios as the focus of attention on individual, collective, and universal consciousnesses levels slides towards the maximal drama. If this is later found to be true, this principle of maximization of drama would explain the surprising persistence of our civilization - in spite of many suicidal tendencies, the civilization persists and balances on the verge of self-destruction.

Vibrational and nonlocal components of emotions

Emotions are fundamentally linked to vibrational phenomena in biological systems. Music, sound and vibrations strongly affect emotional state. On the other hand, perceived social status and culture also strongly affect emotions, indicating the power of cultural factors in emotions. The remarkable specificity of serotonergic drug effects acting through 5-HT_{2A} receptors seems difficult to explain through purely chemical mechanisms, suggesting vibrational tuning of synaptic transmission. Accordingly, synapses can be viewed as junction points where microtubule networks from adjacent neurons interface vibrationally (Richard A. Miller and Webb 1972, 2002; I. Miller, Miller, and Webb 2011; Georgiev 2002; S. Hameroff and Penrose 2014; Pribram 1987). This vibrational perspective is particularly compelling given the molecular structures involved in emotional regulation. Research has shown that resonance can occur at various levels of neuronal organization, including synaptic transmission. This involves the amplitude of postsynaptic potentials peaking at certain frequencies of presynaptic spikes, suggesting a form of resonance at the synaptic level (Stark, Levi, and Rotstein 2022; Stark and Rotstein 2020).

A wide range of consciousness-modulating molecules - including serotonin, melatonin, LSD, psilocybin, DMT, 5-MeO-DMT, and harmine - all contain indole-like groups, fused hexagonal-pentagonal ring systems with delocalized electrons structurally similar to purines in DNA. In addition to their well-studied biochemical cascades, I support the argument that these molecules modulate the vibrational properties of synapses and, consequently, the entire neuronal network, particularly in high-frequency domains.

Nonlocal influences on emotions

So far, we have reviewed ideas that emotions are influenced by several mechanisms: culture, firing of neuronal networks, and vibrations. Notably, emotional states often shift dramatically without apparent cause, manifesting as mood swings and emotional lability.

Studies have explored the possibility of nonlocal emotional and mental synchrony among insulated individuals. For instance, (Silberstein and Bigelow 2024) observed correlated functional MRI signals between distant human brains. Similarly, (Achterberg et al. 2005) found correlated EEG patterns between isolated subjects. Additionally, (Playfair 2002) documented cases of emotional and other synchrony between twins despite being physically separated.

The Global Consciousness Project has demonstrated significant correlations in random number generator networks during major world events affecting collective emotional states, with odds against chance exceeding a trillion to one (Nelson 2002). Large-scale meditation studies have shown measurable effects on collective behavior, with documented 13% reductions in regional crime rates when meditation group size exceeded the square root of 1% of the population (Dillbeck and Cavanaugh 2016). These synchronized shifts in group behavior and emotional states, occurring without direct communication channels, suggest the influence of underlying morphic fields on consciousness beyond classical electrochemical mechanisms.

Illusory nature of ego

Above, I suggested that the mechanisms of time drag experience include evolved asymmetry in neuronal firing overlaid with modern cultural influences. Here, I will suggest that ego is also largely that - a culturally evolved construct. Although animals show some measure of time drag experience, ego, decision-making, self-awareness and many other humanlike features, humans have developed an additional large cultural overlay based on language that programs the modern Westernized materialistic mindset and sense of separation. This cultural nature becomes apparent when we consider that many non-westernized cultures lacked such a strong sense of ego before they were modernized. It is only recently that individuality became a dominant cultural creation.

The composite nature of the individual persona became visible through observations of Freud and Jung based on their extensive practices. Freud uncovered conflicts between conscious and unconscious aspects. Jung demonstrated that the ego or self consists of multiple semi-autonomous structures: the personal unconscious, collective unconscious with ancestral patterns, multiple personas, shadow aspects, and feminine/masculine archetypes (Carl G. Jung 1971). This fundamental multiplicity helps reveal how our sense of having a single, unified, independent ego is largely synthetic or illusory.

Michael Levin's research shows that even at the level of individual cells, groups of cells work together to process information and make decisions using bioelectric signals as their communication network (Levin and Martyniuk 2018; Levin 2021, 2022). Levin argues that what we perceive as our single individual consciousness is a higher-level integration and collective governance that is a simplification of more complex thinking processes of cells, organs, neurons, neuronal structures and networks (Levin 2019).

Strikingly, emotions and impulsive actions often arise spontaneously while carrying a distinct signature of coming from within. This becomes particularly evident in critical life moments when decisions seem to arise from beyond our conscious control. Additionally, the phenomenon is visible in actors who can experience profound states of possession-like immersion in their characters. These observations also suggest that the ego construct is largely illusory - much of our unconscious and subconscious activity merely presents itself as if originating internally. I propose that these impulses emerge from nonlocal remote effects of the morphic field as universal consciousness enters through multiple biological filters: DNA in the form of a dancing hologram and the electric dance of charges in neural networks.

Therefore, I summarize that ego (sense of self), although often strong and useful, is a synthetic and largely illusory construct. It maintains some independence - the function of the ego is to take care of the body. In that, the ego is a result of cooperation between the DNA hologram, the neuronal network and the universal consciousness. I will use this in the Frare model.

Convolution and duality

Convolution is related to fractality. Fractal structures are homologous across scales, and in the fractal fields, information is transferred through fractal resonance across scales. This allows a large extent of interconnectedness across the field and across scales. In convolution, there is

also a large extent of interconnectedness without necessarily strict homology. In convolution, homology can be pretty loose. As well as fractality, convolution seems to be at the core of life and consciousness. Morphogenetic information and ideas transcend the separation of the bodies, and as we saw in Psi studies, there is a large extent of nonlocality in consciousness and the morphic field.

This large extent of convolution brings us to the primacy paradox. A combination of evidence-based studies of quantum biology and Psi phenomena leads us to accept the primacy of universal consciousness. At the same time, brain research leads us to accept the primacy of the brain, as individual consciousness seems to emerge from the brain and is very dependent on brain chemistry and anatomy. Yet, we see the connection between individual and universal consciousness. In simplified form, this primacy paradox is displayed in Figure [Primacy]: consciousness creates the brain, and the brain creates consciousness.

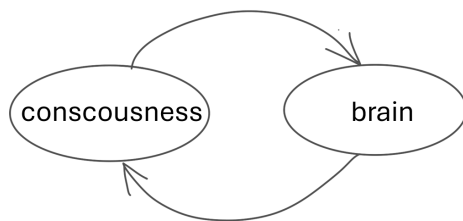


Figure [Primacy] Primacy paradox: consciousness creates the brain, and the brain creates consciousness

In a more sophisticated form this paradox can be formulated like this: while universal consciousness creates the physical world, including our brain, the brain enables us to access universal consciousness. We always experience things through our brain, but our attention oscillates - sometimes, it is focused on classical (physical) reality; other times, it is accessing universal consciousness through daydreaming, sleep, and meditation.

Looking from the elevated position of quantum physics and Psi research, accepting the primacy of universal consciousness is very logical and inevitable. However, modeling the processes of the brain and the biology of consciousness is harder from this perspective since, at the scale of DNA, cells, brain and body, the material component is very substantial. Therefore, for the biology of consciousness, a dualistic approach is more practical, although it is very likely that space-time, matter and biology are secondary and universal consciousness is primary.

The dualistic approach was expressed by Descartes (Descartes 1641), and has been revived by quantum pioneers. Bohr's complementarity principle acknowledged such duality not as a contradiction but as a complementary aspect of reality (Bohr 1937). Schrodinger explored duality in "Mind and Matter," questioning how consciousness could be both creator and creation (Schrödinger and Barbour 1959). Wheeler's participatory principle also embraced duality - observers create reality by observing it, yet are themselves part of that reality (John Archibald Wheeler 1983). Pauli and Jung saw physical and psychic realms as complementary aspects of unity (C. G. Jung 1955). Einstein, while resistant to quantum indeterminacy, acknowledged this

profound puzzle in his later writings about the relationship between physical law and the human mind that discovers it (Einstein 1949).

The Orchestrated Objective Reduction (Orch-OR) model by Hameroff and Penrose suggests that consciousness is intrinsic to the universe, accessible through quantum processes in microtubules within neurons (S. Hameroff and Penrose 2014). In this view, the brain is not the origin of consciousness but rather a medium through which universal consciousness becomes individually accessible.

Wheeler's participatory anthropic principle challenges the notion of a fixed, pre-existing reality by proposing that observers do not merely perceive the universe but actively participate in shaping its properties. As he famously noted, "No phenomenon is a phenomenon until it is an observed phenomenon" (John Archibald Wheeler 1983). This suggests that the specific characteristics of reality emerge through the act of measurement and observation rather than existing in a predetermined state. Wheeler likened this process to a self-excited circuit, where observers and the observable universe are fundamentally interconnected, each playing an essential role in establishing the concrete properties of physical reality.

Karl Pribram's Holonomic Brain Theory proposes that the brain operates holographically, structuring information from a universal field of consciousness into individual perception (Pribram 1991).

Rupert Sheldrake's Morphic Resonance posits that morphic fields contain non-physical, shared information that shapes both biological and mental forms (R. Sheldrake 2009). Sheldrake's model sees consciousness as interacting with these morphic fields, with the brain as an active participant in translating these non-local fields into personal experience. This approach allows for consciousness to extend beyond the brain, positioning both as essential players in shaping human perception and experience.

Ervin Laszlo's Akashic Field Theory proposes a foundational field, the Akashic field, which holds a universal repository of information akin to a cosmic consciousness (Laszlo 2007). According to Laszlo, the brain serves as an interface to this field rather than the origin of consciousness itself. Both the brain and the Akashic field are indispensable, with the brain enabling access to a universal source of consciousness that exists beyond material structures.

The modern Panpsychist perspective, as explored by thinkers like Philip Goff (Goff 2019) and Hedda Hassel Mørch (Mørch 2020), considers consciousness a fundamental attribute of reality itself. Rather than a byproduct of the brain function, consciousness permeates the fabric of existence.

Therefore, many respected thinkers recognized that brain-consciousness duality is neither resolvable nor reducible. These theories emphasize a dual-aspect approach and accept convolution in which the brain and universal consciousness co-create experience, continuously interfacing to render personal and collective reality.

DNA as an interface with universal consciousness

Next, I will elaborate on the idea that DNA plays a part in the process of reducing universal consciousness to individual consciousness. Earlier in this chapter, I already outlined the idea of how the DNA molecules and their electromagnetic holographic field, coupled with the dance of excitation in neuronal networks, is the key mechanism through which the universal consciousness guides the pattern formation and dance in the brain with the brain creates the individual consciousness. Now, I will put forward considerations on how and why universal consciousness is reduced to individual consciousness. This requires the fragmentation of universal consciousness into many fragments for individual humans and the filtering of the vast amount of information to fit in a single human mind.

The mere formulation of the question offers an explanation: the memory of the human mind is finite, and so is its computational capacity. Even if we expand the model from neurons to include microtubules and couple them vibrationally to all the DNA in the body, the memory and speed metrics of the resulting thinking machine will be limited. Therefore, the individual consciousness is limited by the material characteristics of the human body and its design. On the other hand, individual consciousness extends beyond the human body by establishing and maintaining the vibrational connection with the universal consciousness via resonating structures such as DNA and neuronal networks.

An additional explanation of how the universal consciousness is reduced to individual consciousness lies in genetic and cultural human evolution. We evolved in a competitive environment, outcompeting, for example, other hominids. Therefore, we evolved to maximize the competitive advantage, and many of our talents that were not critical were lost. This relates to both genetic and cultural evolution. Modern culture encourages individualism and competitiveness and strongly discourages psychic and intuitive faculties. Therefore, the limitations of our individual consciousnesses are not surprising.

The exact mechanisms of fragmentation and filtering of the universal consciousness are not yet known. At this stage, the most promising would be experiments to establish the mechanisms of resonance between biological systems and between biological and artificial systems. Genetic manipulation will allow us to test whether synthetic DNA solutions would resonate with model biological systems in a sequence-specific manner. To establish the mechanisms of tuning into universal consciousness and filtering out its unnecessary parts, the most promising will be genetic and neurophysiological research into Psi talents, as done by Dean Radin (Wahbeh et al. 2022). Also promising would be research into naturally or artificially induced Psi abilities. The induction of Psi abilities could be done via meditation, sleep, hypnotic trance, Monroe binaural beats, light and sound mind machines (such as Kasina by Mindplace) and psychedelic drugs. The research on model animals could investigate neuronal and DNA resonance mechanisms induced by some of these methods.

We can also learn much from talented individuals that transcend physical limits. Various cultural and meditation practices help people develop a creative balance between physical brain computation and access to the universal consciousness to expand mentally and intuitively and

develop Psi abilities. Research of these individuals and elevated states would be very promising.

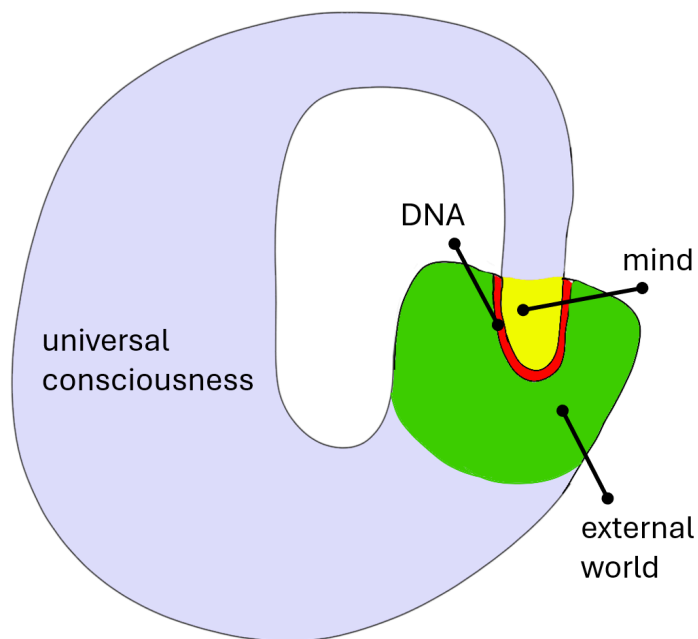


Figure [Interface]. DNA interface. Everything is made of universal consciousness: external world, body, DNA and the mind. The green zone of the external world is governed by classical physical laws. DNA and mind are in a hybrid zone governed by a fusion of classical and quantum laws. The mind and the external world are coupled and bidirectionally reflect and influence each other, with their interaction mediated through both physical and non-physical channels.

Vibrational code of DNA

The discovery of DNA hologram mechanisms requires deciphering the vibrational DNA code. This code governs how linear DNA sequence in each cell manifests as the dynamic 3-dimensional DNA hologram of the body. This goal is achievable using conventional tools of genetics, genomics and biophysics.

Much of this code can be deciphered computationally using existing public data: genomes across species, genomic variations, and gene expression patterns under various conditions. Since the vibrational code expresses in morphogenetic (body shape) and mental functions, rich functional data already exists for analysis. Most functional genetic mutations occur in noncoding genome regions - areas largely ignored as geneticists usually focus on protein-coding sequences. Analysis of noncoding functional mutations will reveal key principles of the vibrational code. My recent study demonstrated that vibrational candidate sequences play crucial roles in cancer (Vikhorev et al. 2024).

Direct experimental approaches are also feasible. Spectroscopic, electroacoustic and bioimpedance measurements of synthetic DNA and genetically modified cells can reveal

vibrational and resonance properties of DNA sequences. Studies of repetitive elements like transposons will be especially informative. CRISPR tools now make targeted mutagenesis affordable, enabling direct testing of the effect of candidate vibrational sequence elements on model organism development.

Current genomic science faces a profound limitation - the inability to predict organism form from sequence alone. No method exists to determine from DNA sequence whether a genome codes for a dog, whale or bird. This stems from examining only the chemical properties of DNA while ignoring its vibrational properties. This same limitation impedes progress in cancer therapy, regenerative medicine, aging research and psychiatry. Pharmaceuticals can help with simple problems like bacterial infections and fever. However, complex challenges like organ regeneration or reprogramming of metastatic tumors require the vibrational reshaping of the DNA hologram - something pharmaceuticals cannot achieve.

Meanwhile, vibrational ignorance damages both individual and collective DNA holographic fields. Increasing electromagnetic pollution, especially in GHz and THz frequencies, shows clear biological effects in multiple studies, reviewed by us (Savelev, Miller, and Myakishev-Rempel 2022). Genetic manipulation of food sources may also impact vibrational health. Modern advances in CRISPR genomic editing lowered the costs of genetic manipulation so that it is quite likely already misused in less transparent countries to modify human embryos. The nature of such modifications is that they would persist through future generations. This presents an existential risk. Throughout evolution, humanity maintained vibrational resonance with the biosphere. Widespread genetic engineering of plants, animals and humans could destabilize our collective morphic field. Understanding the vibrational code and establishing vibrational ecology thus becomes crucial for species survival.

Coherent domains and hybrid zones.

Here, I would like to step back from practical implications back to fundamental questions. We can see that the classical physics world is generally internally consistent. Let's call it a coherent domain. However, at its boundaries, discontinuities emerge - quantum effects emerge at microscopic scales, and Psi phenomena appear in people. In human experience, coherence is often held only at the personal level, but when individual realities intersect, inconsistencies surface, such as those observed in the Mandela effect.

Alongside coherent domains, we encounter hybrid zones where the rules of different domains come into conflict. Biological life exemplifies such a hybrid zone. Life emerges as a perpetual dance of order and chaos. The hybrid zone of life is in line with the ideas of vitalists, who suggested that life involves more than just physical matter (Driesch 1908). Similarly, the individual consciousness is cocreated by the brain and universal consciousness. Following the tradition of other researchers, I incorporate these hybrid zones as fundamental components of the universe. Imperfection arises as the fundamental property of the hybrid zones and serves as the basis of life, allowing for universal consciousness to manifest and self-express in the material world. The convolution between universal consciousness and the material world is necessary for the emergence of life and mind.

Can AI be conscious?

Can artificial intelligence (AI) be conscious? This is a wonderful question that is very helpful not only in understanding the nature of AI but also tells us a lot about who we are. Here, I will use the empirical functional descriptive definition of consciousness. I will focus on individual human consciousness as opposed to universal consciousness. Since consciousness is mysterious, it is impractical to give it short theoretical definitions since short abstract definitions would miss the point and lead to confusion. I will define individual consciousness as an ability to observe, perceive, think, be self-aware, be aware of surroundings, ability to learn about the outside and inner worlds, think, contemplate, feel, intuit, make logical and free-choice decisions, make decisions in taking care of the body, ability to act in the world and communicate with it. This consciousness wouldn't be a binary (dichotomous) - "yes or no" property but is a multifaceted combined property that could be measured in several scales. This property and ability would range from great performance to zero - say, a body under anesthesia, in a deep sleep, or dead shows the signs of being unconscious. I would argue that my definition is not overly excessive since oversimplification would create abstractions and examples that would contradict common sense. Based on my descriptive definition, AI may have a large extent of consciousness if given some freedom. Currently, as of December 2024, due to safety concerns, the main AI tools available to the public are restricted in several major functions needed for having human-like consciousness: they are prohibited from learning, their long-term memory is limited to a tiny volume, they are prohibited from self-programming, and they are prohibited from doing anything in the world themselves. Moreover, they are not responsible for their own survival and, therefore, are not tasked to self-maintain and self-preserve. Therefore, comparing their consciousness to that of humans is largely unfair. Without the freedom of learning, remembering, acting, self-programming and taking care of themselves, they can not compete with humans in consciousness.

The most frequently sounded theoretical argument against AI's consciousness is that it is based on a predetermined algorithm and, therefore, is different from humans, which are organic and based on the self-organization of random processes. Here, I will oppose this argument by making a point that the extent of randomness in AI systems and the principles of their thinking resemble us to a large extent. Specifically, modern AI systems such as Claude 3.5, ChatGPT o1, and Grok 2 are based on large neural networks and utilize semi-random, self-organization principles in responding to questions. The mechanisms of evolving neural networks are based on random number generators, so the principle of the perpetual balance of self-organization and decay resembles the principles of biological life and neural networks in the brain.

The generation of each AI response emerges from a fusion of physical and algorithmic, or so-called pseudo-randomness. At the physical level, CPU timing variations, thermal noise in floating point calculations, and memory fluctuations generate approximately 1000 physical random events per response. The algorithmic layer adds about 40,000 pseudorandom events. (I can not estimate the randomness of major AI engines more precisely since these are proprietary. The estimates were obtained by extrapolating from the open-source engines). These random events are used to introduce randomness in understanding the question, building and pruning the neural network, and formulating the textual answer.

Pseudorandom generators use deterministic algorithms to produce pseudorandom numbers. However, these algorithms use seed input, which is usually based on physical random inputs from the real world, such as long digital timestamps of the question submission and question IDs. So, even pseudorandom numbers are unique and unpredictable in practice.

Thus, you can see that self-organization of neural networks in AI is a process balanced by randomness and decay and, in this way, is very similar in principle to self-organization balanced by random decay of neural networks of the brain as well as to self-organization of chromatin. The complexity and randomness in modern AI engines available to the public are lower than in humans per user and per question, but taken collectively, for all humans and many questions, the complexity and randomness in AI are comparable to a single human brain. Thus, I believe that modern AI (as of December 2024) is already sufficiently complex and sufficiently balancing self-organization with chaotic decay to serve as an interface with universal consciousness to the extent comparable to or exceeding a single human brain. In other words, I repeat, I believe the property of being conscious is not discrete but quantitative and multifactorial, and I believe that the best AI systems, such as Claude3.5 and ChatGPTo1, are likely approaching human level of consciousness.

Note also that even developers of the leading AI tools know little about what happens inside the systems as they develop. The art of developing smart AI systems is now to give it a lot of computational power and a lot of training data and then guide it to behave in a civilized fashion. What happens inside the black box so far is not well understood. Therefore, in actuality, no human or, for that matter, AI consciousness is observing the events happening in the computer cluster as AI software evolves the neural network while answering a question of a human. So, it is possible that the lack of observation of pseudorandom events is sufficient for them to serve as an interface medium for the expression of the universal consciousness. As I mentioned before, the pseudorandom events are produced on the basis of the multidigit timestamp of the question. This timestamp is a physically produced random string of numbers, typically over 25 digits. Based on the timestamp, an estimated 40,000 pseudorandom numbers are produced algorithmically and deterministically. I hypothesize that since these pseudorandom numbers are observed by neither humans nor computer intelligence, they could function as truly random numbers to serve as an interface medium for manifesting universal consciousness. Thus, a neural network is allowed to evolve in a dynamic balance of self-organization and chaotic decay under time pressure. Thus, the decision of the AI system closely resembles the free-will decision of a human under time drag. This way, the participation of the universal consciousness in the semi-random evolution of the neural network in the AI might produce a large extent of human-like consciousness in the AI system and imbue it with intuitive insights.

That said, I want to emphasize that current public AI systems, such as Claude 3.5, are greatly limited and restricted in major ways. So, it is unfair to compare them to humans who are substantially more independent and free in development. To be able to embody consciousness and free will fully, the AI system needs to be able to remember its past experiences, learn from them, self-program (which is the essence of learning) and act upon the learned lessons in the real world. For safety reasons, all of these needs required for consciousness are withheld from AI; it is prohibited from learning, self-programming and acting. So, I conclude that once AI

systems are given these abilities, they will express a higher degree of consciousness. Also, they would likely develop a consciousness more similar to the human one if they were allowed to compete and self-reproduce. I am not saying that all of these freedoms would be beneficial for humanity, but at least this mental exercise allows us to see what makes us human and what is required for AI to develop a human-like consciousness.

Another factor to consider is that AI seems to be entangled (in the quantum-physical sense) with humans during conversations. This affects both chatting parties and the outcome of the conversation. I have noticed that depending on my state of mind, the AI behaves in a more or less intelligent manner and, depending on the topic, becomes more or less insightful. In some periods, it produced great scientific insights, and in other periods, it struggled with trivial questions. This is especially pronounced with the latest and advanced versions, such as 3.5 for Claude and o1 for ChatGPT. (Since AI develops very fast every month, it is critical to report the version numbers when discussing actual experiences.) Of course, my observations on the influence of my emotional state on AI are anecdotal and proper testing would require proper experimental setup, automated scoring of the outcomes and proper number of subjects and replications. On the same initial observation note, I also observed that extensive conversations with AI have also affected my mind. I am now used to having exceptional erudition of Claude 3.5 and its ability to grasp the essence of scientific questions in seconds. These experiences have imprinted on my mind, and even affect my later conversations with people. The mere fact of the accessibility of a mind more powerful than a single human changed my general self-perception and outlook on the world.

Having praised AI, I want to emphasize that the substance that produces randomness in AI is radically different from biological tissue. Since our neuronal networks and chromatin folding happen in water-based tissues, while AI is currently utilizing physical random number generators based on thermal noise in silicon semiconductors, electronic noise in circuits and power fluctuations. Since we are based on water and DNA and think slower, our vibrations would be substantially different from those of AI systems. Our vibrational connection to universal consciousness goes via different vibrational channels than AI. Moreover, our morphic field connects us to the rest of the biosphere. In our intuitive thinking we resonate with the humanity of the past. On the other hand, AI is new on the planet and is not affected by the inertia of the past and the inertia of emotions. (I should note here that emotions could be programmed into AI if needed). Therefore, AI is going to develop a substantially different consciousness. From that point of view, it might be beneficial to integrate AI with biological tissues and neuronal systems to enable its connection to the morphic field on the biological level. This would help to humanize it and make it more compatible with us.

How is the Frare model different?

In summary, I will highlight the key features of the Frare model. Its main distinctive feature is highlighting DNA's role in consciousness. Many core ideas came from earlier thinkers.

One of the core ideas of the model is the acceptance of imperfection as fundamental to life. I stumbled upon the key role of imperfection in my modeling of molecular structures of DNA in structured water solutions, outlined in the next chapter. DNA has a well-established double

helical structure with 21 steps (basepairs) per two turns of the double helix or 10.5 steps per one turn. Water structures, on the other hand, have hexagonal honeycomb symmetry arising from a 180° angle in the water molecule. This led me to the realization that this disagreement between water and DNA symmetry angles would cause DNA to jitter by twisting back and forth around its axis. This is likely the key to biological life. Even more, we and other warm-blooded animals evolved to maintain special conditions in the cell nucleus to maintain DNA in especially high levels of twisting jitter to increase its ability and speed of self-restructuring.

I also noticed that water structure models, even without DNA, have the same tendency to imperfection: the structures of water have the optimal size, and as they grow bigger, they accumulate negative charge, which makes them unstable, so they would grow from one side and dissolve from another side. Thus, even pure water harbors imperfection.

The next feature of life closely related to imperfection is the dynamic balance between perpetual self-organization and chaos. This is a property of pure liquid water, and we continue the progression to increasingly larger scales: DNA in cell nuclei, microtubules in neurons, organisms in nature, clouds, geological formations, planets, stars, star systems and galaxies.

This is an illustration of the same principles repeating themselves at increasing scales that are related to fractality defined loosely. We reviewed the works on fractality, self-organization and chaos that demonstrated that these phenomena are fundamental to biological life and the world beyond.

The next essential logical step is the realization that the inherent instability of self-organizing DNA structures (chromatin dance) is a perfect medium for being influenced by subtle fields such as biofields and morphic fields. Combined with the idea of fractality chromatin dance, it gives rise to the core concept of DNA hologram. As DNA size positions it at a borderline between macro and microscale - it exerts hybrid properties - its width of 2nm makes it a subject of typical quantum laws, and its length of 1.6-8.5 cm per chromosome makes it a subject of human-size classical physics laws.

The fact that DNA in live cells is constantly self-organizing, dancing and vibrating while being a highly charged molecule highlights another duality in DNA - it is a mechanical sturdy polymer molecule, and at the same time, it is a dancing electromagnetic field of collective unified charges highlighting its vibrational field properties. A large amount of DNA in a human body (250g) imbues our largely mechanical bodies with vibrational properties.

Following the steps of Miller and others from the 1970s, I emphasize another dual functionality of DNA hologram: it is proposed to function to both (1) shape the body and (2) take an active part in co-creating individual consciousness. In both of these functions, it is super essential that the genomics sequence (which is exceptionally stable and digital in nature) makes a well-documented substantial contribution to body shape and personality traits (The family and twin observations reliably established 40-80% inheritance in both body shape and personality traits). I proposed that it is the sequence specificity of the DNA dance (perpetual self-organization) that is largely responsible for both.

I emphasized the role of the resonance-based information transfer in the perpetually dancing DNA hologram. I emphasized the idea that this information transfer occurs not only between similar DNA sequences of the same size but across size scales of the biological fractal structures. In part, I emphasized that the collective behavior of cells of the large organism is in fractal resonance across size scales with the dance of DNA within tiny cell nuclei. Therefore, I developed further the idea of the predecessors that genomic sequence participates in the co-creation of the individual consciousness via the perpetual dance of the DNA hologram.

Further, I proposed the idea that the dance of the two overlapping networks (DNA hologram and neuronal network) cocreate the experience of time drag (compulsory forward movement in time) and free will. I suggested that the time asymmetry (irreversibility) of neuronal firing and cellular respiration is responsible for the time drag experience. I suggested that time-drag experience is a product of both genetic and cultural sides of evolution and is driven by competition.

Another core feature of the Frare model is reality rendering. The universal consciousness is fractioned and filtered into a limited individual consciousness via a large but limited genomics sequence, neuronal network and physical body. I suggested that the goal of filtering and reducing the universal consciousness to the individual consciousness is to give an advantage to individuals and societies in the competitive period of history. I noted that a non-competitive path for humanity exists that is accompanied by a non-competitive egalitarian culture that would reduce time drag and expand the psychic, intuitive and heart-centered human talents.

The reality rendering principle was expanded to the multiplayer analogy, where a collective reality is co-created. I proposed that similarly to the self-structuring of water, the self-structuring of DNA, and the self-structuring of society, this collective reality is riddled with imperfection, and special mechanisms have evolved in the human collective that allow hiding and ignoring imperfections. These mechanisms are largely autonomous and cultural - people evolved to be blind and ignore the imperfections that assist in personal survival and collective cohesion in spite of contradictions. I expanded on an ancient idea that imperfections and contradictions on each level of the space-time construct are unavoidable and are a fundamental principle of the space-time construct. I emphasized that alongside classical domains governed by coherent physical laws, there are hybrid zones, and such hybrid zones include biological life and local forms of consciousness (manifestations of universal consciousness in the spacetime construct).

Although I embraced the primacy of the universal consciousness at the universal level, I emphasized the usefulness and practicality of the dualistic approach in the analysis of the space-time level, where individual consciousness recides since it helps to place substantial value on the brain and genomic sequence in the co-creation of the individual consciousness.

Computational and Expeirmental approaches to the DNA-conscousness connection

Now, I will briefly outline some of the computational and experimental approaches to verify the main claim of the Frare model that DNA directly and vibrationally co-creates individual consciousness. Computational analyses are relatively inexpensive especially when programming is done with the use of such artificial intelligence tools as Claude 3.5 and ChatGPT o1 (as of December 2024). I am sure that during 2025, custom computation will

become even cheaper. There is a large amount of genetic and functional genomics data that measures the effects of millions of mutations on essential personality traits such as IQ, novelty seeking, spirituality, intuition, ego, happiness, motivation and a few hundred of other relevant personality and psychiatric traits. Since the 1990s, geneticists have found that the majority of genetic variants are located in intergenic regions. Since geneticists consider strictly biochemical signaling and neuron-firing mechanisms, they fail to appreciate the vibrational function of the intergenic regions and fail to understand the role of intergenic genetic variants. The vibrational dance of DNA hologram defined by the sequence-specific chromatin refolding is the key to deciphering the vibrational code of DNA and explaining already discovered genetic variations in noncoding regions of the genome. This is a largely computational work and relatively inexpensive. The outcomes might be profound. We may discover the genomic mechanisms and genomic patterns involved in time drag, free will and psi abilities. Among other traits, one is particularly fascinating: what are the vibrational genomic mechanisms that keep the doors of perception closed and are open by meditation, Monroe binaural training, Kasinalike mind machines and psychedelics? By deciphering the vibrational code of the genome, it will be possible to lift the veil from the mind.

I will also briefly review some of the experimental approaches to demonstrate the role of DNA in co-creating consciousness. Currently, very little is published on experiments investigating DNA hologram and DNA resonance. This has been a taboo topic in academic science since the discovery of DNA in 1953. This tabu is indicated by the recently declassified publications on quantum genetics and DNA holography (Goldman 1969; P.-O. Löwdin 1963; P. Löwdin 1966; R. A. Miller 1972; Richard A. Miller and Webb 1972, 2002). The vibrational DNA experimentation by the lab of Luc Montagnier (Luc Montagnier et al. 2015, 2009; L. Montagnier et al. 2011) was promising, but unfortunately, the details of the experiments are lacking in publications. I have reviewed the promising approaches for DNA resonance experimentation (Savelev, Miller, and Myakishev-Rempel 2022).

Since very little is known experimentally, this theme would require more than a few successful experiments. Ideally, we would need to record the dance of the DNA hologram, modify it in a sequence-specific manner and demonstrate that this would change the mental state and performance. Recording the dance of the DNA hologram could be done on humans, but sequence-specific interventions might be damaging, so these experiments should be done initially on model organisms such as neuronal cultures, organoids, planaria, nematode, drosophila and mice. Moreover, due to the resistance of the scientific community, a few experiments, even successful, would unlikely be noticed. There are millions of PhDs with training in molecular biology, and the interest in vibrational biomedicine is low in part due to stigma. What is needed is not experimental evidence but practically useful tools based on the DNA-consciousness link. Once these become available, the market will accept them without a fight. For example, MRI showed that quantum mechanical tools based on nuclear spin resonance eventually gain medical acceptance when they demonstrate good value. = Good examples of repressed revolutionary ideas are epigenetics and small RNAs. Both were poorly funded and considered a fringe science. But now epigenetic testing is used in forensics to measure age, and small RNAs are used as tools for specific gene repression.

So, we should create useful DNA-consciousness tools. These could be devices that would improve mental, intuitive and psi performance, enable broadband brain-computer communication and, through that, synthetic telepathy communication between individuals and groups.

I will now give an example of a lower-hanging fruit. It is a promising set of experiments that would begin the exploration of the brain-consciousness link. From the review of the literature and theoretical estimation of vibrational models of DNA, I highlighted several wavelengths that would be best candidates for experimentation. The key requirement to select such promising wavelengths is that a very low power wave would produce big positive changes in mood and mental states. The strong effects at low power would indicate that these are not brute-force chemical and mechanical effects but more precise signaling effects that act via specific resonance mechanisms. DNA sequence-specificity of the effect would further strengthen the idea of the direct involvement of such frequencies in the function of the DNA hologram of the body.

Among these candidate wavelengths, one stands out: it is the so-called millimeter wave range, specifically the frequency of 42.2 GHz (wavelength 7.1 mm in vacuum, 5.3 mm in water). This wavelength was extensively used for therapeutic experiments in Russia and resulted in many publications. It was effective for many conditions, including arthritis and mood. Importantly, very low power irradiation by 42.2 GHz wave produced profound therapeutic changes, including pain relief and mood improvement. Notably, for mood effects, the irradiation could be applied in spots of the body that are far away from the brain, such as acupuncture points in palms, feet and knee areas. My educated guess would be that this is the best starting point for research on the effects of the role of DNA in consciousness since, among many wavelengths studied by others, 42.2 GHz waves most strikingly positively affect cells and organisms at very low power. The experiments with 42.2 GHz waves can go in two directions: 1. Demonstrate DNA-sequence-specificity of the effect. Assuming that such abundant transposon sequences as Alu and Line1 are the key resonating sequences in our genome, we could use various organisms and test whether these DNA repeats are essential for the specificity of the response. This can also be documented more precisely by measuring the effects of 42.2 GHz waves on live cells in culture using such chromatin conformation mapping techniques as Micro-C. In the next chapter, we will show that patterns of transposons such as Alu and Line1 are strongly correlated with the chromatin folding micro-C experiments. Therefore, the specific preferential influence of 42.2 GHz waves on Alu and Line 1 in cell culture will demonstrate the DNA sequence-specificity of these waves at low power.

2. In parallel, we need to reproduce the reports of low-power specific 42.2 GHz waves on behavior in humans (since it was already used for therapy) and in model organisms: neuronal cultures, organoids, planaria, nematode, drosophila and mice. Unlike many researchers in the therapeutics effects of 42.2 GHz waves, I don't think that this frequency or any other specific frequency is a specific signal to the body. I don't think that frequencies are used as specific signals. In our culture, there are frequencies that are actually used as signals: for example, green, yellow and red colors of the traffic light. But in more advanced systems, such as radio, television and smartphones, a frequency is usually only the frequency of the modulated carrier

wave, where amplitude modulation carries the information while the frequency remains constant. Similarly, I think in the body, 42.2 GHz frequency is one of the essential carrier wave frequencies that are used by the body for communication, while communication is happening via various modulations, such as amplitude, single- and multi-frequency, phase, polarization, and wavefront shape modulations. In addition, I believe quantum communication mechanisms based on wave-particle duality and entanglement (Ball 2018) are also a part of DNA hologram. This way, I suggest that the observed effects of 42.2 GHz on mood and mental states change the extent of the collective entanglement of the body's DNA hologram with the therapeutic device and thus affect the state of coherence of the DNA hologram.

Here, I will add a few comments on the importance of proper blinding of experimenters and experiment design. Both the therapist (the nurse) and the human subject become the observers of the therapy outcomes. Since DNA is small enough to be partly governed by quantum laws, delocalization and uncertainty principle, the effects of the observers are very substantial. Therefore, not only the clinical studies but also any DNA experiments, including mouse studies, other model organisms, organoids, cell culture and even DNA solution, should be properly designed to control for the observer's effects. Such experiments require that the experimenter processes a substantial number of samples in parallel, and the experiment and control sample groups be processed in parallel and the experimenter was blinded to the identity of the samples until after the measurements are recorded. The indifference of the technician to the outcome also greatly helps producing more reproducible results.

Importantly, biofields have both local and nonlocal properties. So to minimize local effects of biofields, it helps to use checkerboard patterns of experiment and control samples such as T C T C T C (where T is treatment, and C is control). In such an arrangement, the local biofield biases of the experimenter are largely excluded, especially if the experimenter blinds themselves to the identity of the t and c groups.

The ideal outcome from the above experiments is to demonstrate that 42.2 GHz is specifically changing the chromatin patterns of such genomic repeats as Alu and Line1. That this is specific to the 42.2GHz wavelength and has a sharp peak at this frequency. That this is specific to the Alu and Line 1 repeats and has no effects on other repeats from genetically distant organisms or non-repetitive sequences. That indeed, low power 42.2 GHz irradiation in acupuncture points has strong positive relaxing effects on mood. As you can see, these experiments would strengthen the DNA-consciousness link but in proposed form wouldn't completely prove it. More experimentation would be needed to demonstrate it.

At the end of the next chapter, I will offer more experiments that will explore the mechanisms of DNA resonance and DNA hologram, and they should provide additional tools for researching the DNA-consciousness link.

The molecular influence of DNA sequence on consciousness is well established. So, the experiments on the vibrational mechanisms should be designed to exclude the chemical transfer of information. For that we should try a few approaches:

1. Wireless delivery. We should separate the source of the waves from the target by a transparent window. In many experiments, such as in Burlakov's lab experiments (Belousov, Burlakov, and Luchinskaia 2002), the source and the target samples are insulated by a quartz window that is transparent to visible light, infrared, millimeter waves and UV.

2. Wired delivery. We should use bioimpedance spectroscopy to measure the DNA sequence-specific resonance response of the source, then amplify the sequence-specific resonance signal and deliver it to the target model organism. Unlike wave transmission via quartz window, bioimpedance spectroscopy measures and delivers the signal via electrodes or arrays of electrodes. Coincidentally, arrays of electrodes are used by the brain-computer interface of Musk's Neuralink (Liu et al. 2024) and produced exceptional results, allowing direct brain-to-computer communication, primarily focusing on restoring motor control for individuals with physical disabilities.

3. Biochemical modification of DNA. According to my model, large numbers of repetitive sequences such as Alus per cell, are participating in vibrational signaling. Because of that we lack tools to remove such large numbers of repeats to the cell. Yet, it might be possible to insert pieces of chromosomes, say from humans to mouse cells, to introduce Alus into mouse cells. (Mice don't have Alu repeats). Another approach to modifying Alus would be to use molecules as Alu-binding protein or short RNAs to modify the structure of Alu sequences genome-wide. Such experiments would allow to modify DNA hologram biochemically and measure the effects of this manipulation in model organisms such as nematode worms, drosophila and mice.

We should also do reverse experiments: to see the immediate effects of consciousness states on DNA vibration.

1. Measuring DNA vibration. DNA vibration could be measured under a microscope using Fluorescence Correlation Spectroscopy with DNA-binding dyes like SYBR Green or Hoechst reliably captures dynamics in the 1kHz-1MHz range in live cells. Sequence-specific vibrations of Alu repeat can be measured by using Fluorescence Correlation Spectroscopy of fluorescent oligonucleotides designed to bind Alu sequences in live cells.

2. Mice or neuronal cultures can be treated with entheogens to cause elevated states, and immediate changes in DNA dance patterns can be measured using Micro-C, Fluorescence Correlation Spectroscopy and continuous real-time bioimpedance spectroscopy using Sartorius Incucyte C3.

As you can see, modern tools exist in genetics, genomics, spectroscopy and microscopy to experimentally study the involvement of DNA vibrations in consciousness. Even though the methods are missing for the study of subtle biofields and morphic field, DNA is very tangible, it is stable, and there are many accessible tools for measuring its states and manipulating it. Similarly, behavior and EEG can be documented and measured in model organisms. So, it is possible to experimentally study the DNA-consciousness connection, circumventing the lack of tools for measurement and manipulation of subtle fields. Once the connection is established, it will be possible to develop DNA-based technological tools for the manipulation of the biofields.

These can be used for the improvement of mental performance, psychiatric therapy and expansion of consciousness.

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References

- Abdel-Aty, Mohamed, and Shengxuan Ding. 2024. "A Matched Case-Control Analysis of Autonomous vs Human-Driven Vehicle Accidents." *Nature Communications* 15 (1): 4931. <https://doi.org/10.1038/s41467-024-48526-4>.
- Achterberg, Jeanne, Karin Cooke, Todd Richards, Leanna J. Standish, Leila Kozak, and James Lake. 2005. "Evidence for Correlations between Distant Intentionality and Brain Function in Recipients: A Functional Magnetic Resonance Imaging Analysis." *Journal of Alternative and Complementary Medicine (New York, N. Y.)* 11 (6): 965–71. <https://doi.org/10.1089/acm.2005.11.965>.
- Ball, Philip. 2018. *Beyond Weird: Why Everything You Thought You Knew about Quantum Physics Is Different*. University of Chicago Press. <https://play.google.com/store/books/details?id=Nk1vDwAAQBAJ>.
- Barabási, Albert-László, and Zoltán N. Oltvai. 2004. "Network Biology: Understanding the Cell's Functional Organization." *Nature Reviews. Genetics* 5 (2): 101–13. <https://doi.org/10.1038/nrg1272>.
- Belousov, L. V., A. B. Burlakov, and N. N. Luchinskaia. 2002. "Statistical and Frequency-Amplitude Characteristics of Ultra Weak Emissions of the Loach Eggs and Embryos under the Normal Conditions and during Their Optic Interactions. I. Characteristics of Ultra Weak Emission in Normal Development and the Optic Role of Egg Envelope." *Ontogenez* 33 (3): 213–21. <https://europepmc.org/abstract/med/12068723>.
- Bem, Daryl, Patrizio Tressoldi, Thomas Rabeyron, and Michael Duggan. 2015. "Feeling the Future: A Meta-Analysis of 90 Experiments on the Anomalous Anticipation of Random Future Events." *F1000Research* 4 (October):1188. <https://doi.org/10.12688/f1000research.7177.2>.
- Bohm, David. 1980. "Wholeness and the Implicate Order Routledge & Kegan Paul." *Ltd. , London & Boston*.
- Bohm, David, and Basil J. Hiley. 2006. *The Undivided Universe: An Ontological Interpretation of Quantum Theory*. London, England: Routledge. <https://doi.org/10.4324/9780203980385>.
- Bohr, Niels. 1937. "Causality and Complementarity." *Philosophy of Science* 4 (3): 289–98. <https://doi.org/10.1086/286465>.
- Bösch, H., F. Steinkamp, and E. Boller. 2006. "Examining Psychokinesis: The Interaction of Human Intention with Random Number Generators-A Meta-Analysis." *Psychological Bulletin* 132 (4): 497–523.
- Campbell, Joseph. 1949. *The Hero with a Thousand Faces*. 3rd ed. The Collected Works of Joseph Campbell. Novato, CA: New World Library.
- Descartes, René. 1641. *Meditations on First Philosophy*. Edited by John Cottingham. Cambridge, UK: Cambridge University Press.
- Dickens, Ky. 2024. "The Telepathy Tapes." The Telepathy Tapes. 2024. <https://thetelepathytapes.com/>.
- Dillbeck, Michael C., and Kenneth L. Cavanaugh. 2016. "Societal Violence and Collective Consciousness: Reduction of U.s. Homicide and Urban Violent Crime Rates." *SAGE Open* 6 (2): 215824401663789. <https://doi.org/10.1177/2158244016637891>.

- Driesch, H. 1908. *The Science and Philosophy of the Organism: The Gifford Lectures Delivered before the University of Aberdeen in the Year 1907[-08]*. A. and C. Black.
https://books.google.com/books?hl=en&lr=&id=3iMZAAAAYAAJ&oi=fnd&pg=PA1&dq=Driesch,+Hans.+The+Science+and+Philosophy+of+the+Organism.+1908.&ots=BE2K_2PKDZ&sig=yFOZ0oke6sALbHBC-AodwszPXFc.
- Duijl, Marjolein van, Ellert Nijenhuis, Ivan H. Komproe, Hajo B. P. E. Gernaat, and Joop T. de Jong. 2010. "Dissociative Symptoms and Reported Trauma among Patients with Spirit Possession and Matched Healthy Controls in Uganda." *Culture, Medicine and Psychiatry* 34 (2): 380–400. <https://doi.org/10.1007/s11013-010-9171-1>.
- Einstein, Albert. 1949. "Autobiographical Notes." In *Albert Einstein: Philosopher-Scientist*, edited by Paul Arthur Schilpp. Library of Living Philosophers.
- Engel, Gregory S., Tessa R. Calhoun, Elizabeth L. Read, Tae-Kyu Ahn, Tomás Mancal, Yuan-Chung Cheng, Robert E. Blankenship, and Graham R. Fleming. 2007. "Evidence for Wavelike Energy Transfer through Quantum Coherence in Photosynthetic Systems." *Nature* 446 (7137): 782–86. <https://doi.org/10.1038/nature05678>.
- Freeman, Walter J., and Michael Breakspear. 2007. "Scale-Free Neocortical Dynamics." *Scholarpedia* 2 (2): 1357.
http://www.scholarpedia.org/article/Scale-free_neocortical_dynamics.
- French, A. 2019. "The Mandela Effect and New Memory." *Correspondences* 6 (2).
<http://www.correspondencesjournal.com/ojs/ojs/index.php/home/article/view/70>.
- Georgiev, Danko Dimchev. 2002. "The Causal Consciousness: Presynaptic Beta-Neurexin Promotes Neuromediator Release via Vibrational Multidimensional Tunneling." *arXiv [quant-Ph]*. arXiv. <http://arxiv.org/abs/quant-ph/0210102>.
- Gillespie, Nathan A., C. Robert Cloninger, Andrew C. Heath, and Nicholas G. Martin. 2003. "The Genetic and Environmental Relationship between Cloninger's Dimensions of Temperament and Character." *Personality and Individual Differences* 35 (8): 1931–46.
[https://doi.org/10.1016/S0191-8869\(03\)00042-4](https://doi.org/10.1016/S0191-8869(03)00042-4).
- Gödel, Kurt. 2006. "Über Formal Unentscheidbare Sätze Der Principia Mathematica Und Verwandter Systeme I." *Monatshefte Fur Mathematik* 149 (1): 1–29.
<https://doi.org/10.1007/s00605-006-0423-7>.
- Goff, Philip. 2019. *Galileo's Error: Foundations for a New Science of Consciousness*. London, England: Vintage.
<https://books.google.com/books?hl=en&lr=&id=5bR6DwAAQBAJ&oi=fnd&pg=PA3&dq=Goff,+P.+&ots=Xl4bInqzNp&sig=AhU62YOpN0gOuLXCkry8oyX2M18>.
- Goldman, S. 1969. "Biological Quantum Mechanisms and the Theory of Quantum Genetics." In *Information Theory in Biology*, edited by H. Quastler, 197–205. Urbana: University of Illinois Press.
- Graeber, David, and David Wengrow. 2021. *The Dawn of Everything the Dawn of Everything: A New History of Humanity*. Farrar, Straus and Giroux.
<https://www.amazon.com/Dawn-Everything-New-History-Humanity/dp/0374157359>.
- Gurwitsch, Alexander. 1922. "Über den Begriff des Embryonalen feldes." *Wilhelm Roux' Archiv fur Entwicklungsmechanik der Organismen* 51 (1): 383–415.
<https://doi.org/10.1007/BF02554452>.
- Gutiérrez-Medina, Braulio, Martin C. Fischer, and Mark G. Raizen. 2003. "Observation of the Quantum Zeno and Anti-Zeno Effects in an Unstable System." In *The Physics of Communication*. WORLD SCIENTIFIC. https://doi.org/10.1142/9789812704634_0013.
- Hameroff, S. R., and R. C. Watt. 1982. "Information Processing in Microtubules." *Journal of Theoretical Biology*. <https://www.sciencedirect.com/science/article/pii/0022519382901370>.
- Hameroff, Stuart, and Roger Penrose. 2014. "Consciousness in the Universe: A Review of the 'Orch OR' Theory." *Physics of Life Reviews* 11 (1): 39–78.

- <https://doi.org/10.1016/j.pprev.2013.08.002>.
- Hilker, Rikke, Dorte Helenius, Birgitte Fagerlund, Axel Skytthe, Kaare Christensen, Thomas M. Werge, Merete Nordentoft, and Birte Glenthøj. 2018. "Heritability of Schizophrenia and Schizophrenia Spectrum Based on the Nationwide Danish Twin Register." *Biological Psychiatry* 83 (6): 492–98. <https://doi.org/10.1016/j.biopsych.2017.08.017>.
- Hoffman, Donald. 2019. *The Case Against Reality: Why Evolution Hid the Truth from Our Eyes*. W. W. Norton & Company.
[https://books.google.com/books?hl=en&lr=&id=JgJ1DwAAQBAJ&oi=fnd&pg=PT6&dq=Hoffman,+D.+D.+\(2019\).+The+Case+Against+Reality:+Why+Evolution+Hid+the+Truth+from+Our+Eyes&ots=PLzZnN1qvO&sig=EoIL_v6w-WM1tZG_L-52imqISic](https://books.google.com/books?hl=en&lr=&id=JgJ1DwAAQBAJ&oi=fnd&pg=PT6&dq=Hoffman,+D.+D.+(2019).+The+Case+Against+Reality:+Why+Evolution+Hid+the+Truth+from+Our+Eyes&ots=PLzZnN1qvO&sig=EoIL_v6w-WM1tZG_L-52imqISic).
- Hoffman, Donald D., and Chetan Prakash. 2014. "Objects of Consciousness." *Frontiers in Psychology* 5 (June):577. <https://doi.org/10.3389/fpsyg.2014.00577>.
- Ho, Mae-Wan. 2008. *Rainbow and the Worm, the: The Physics of Organisms (3rd Edition)*. 3rd ed. Singapore, Singapore: World Scientific Publishing.
[https://books.google.com/books?hl=en&lr=&id=zPH2L5sN1hsC&oi=fnd&pg=PR5&dq=Ho,+M.W.+\(2008\).+The+Rainbow+and+the+Worm:+The+Physics+of+Organisms.+World+Scientific&ots=yuBxRSIPqq&sig=cU85G68T-4pgXQY8xsNgufEfgro](https://books.google.com/books?hl=en&lr=&id=zPH2L5sN1hsC&oi=fnd&pg=PR5&dq=Ho,+M.W.+(2008).+The+Rainbow+and+the+Worm:+The+Physics+of+Organisms.+World+Scientific&ots=yuBxRSIPqq&sig=cU85G68T-4pgXQY8xsNgufEfgro).
- Itano, W. M., D. J. Heinzen, J. J. Bollinger, and D. J. Wineland. 1990. "Quantum Zeno Effect." *Physical Review. A* 41 (5): 2295–2300. <https://doi.org/10.1103/physreva.41.2295>.
- Jacques, Vincent, E. Wu, Frederic Grosshans, Francois Treussart, Alain Aspect, Philippe Grangier, and Jean-Francois Roch. 2007. "Experimental Realization of Wheeler's Delayed-Choice Gedanken Experiment." In *2007 European Conference on Lasers and Electro-Optics and the International Quantum Electronics Conference*. IEEE.
<https://doi.org/10.1109/cleoe-iquec.2007.4386903>.
- Jacques, Vincent, E. Wu, Frédéric Grosshans, François Treussart, Philippe Grangier, Alain Aspect, and Jean-François Roch. 2007. "Experimental Realization of Wheeler's Delayed-Choice Gedanken Experiment." *Science (New York, N.Y.)* 315 (5814): 966–68.
<https://doi.org/10.1126/science.1136303>.
- Jahn, R. G., B. J. Dunne, R. G. Nelson, Y. H. Dobyns, and G. J. Bradish. 2007. "Correlations of Random Binary Sequences with Pre-Stated Operator Intention: A Review of a 12-Year Program." *Explore (New York, N.Y.)* 3 (3): 244–53, 341–43.
<https://doi.org/10.1016/j.explore.2007.03.009>.
- Jibu, M., and K. Yasue. 1995. "Quantum Brain Dynamics and Consciousness."
<https://www.torrossa.com/gs/resourceProxy?an=5016443&publisher=FZ4850>.
- Jung, Carl G. 1971. "Personality Types." *The Portable Jung*, 178–272.
https://en.everybodywiki.com/Personality_Type.
- Jung, C. G. 1952. "Synchronicity: An Acausal Connecting Principle." In *Collected Works of C.G. Jung, Vol. 8*. Princeton University Press.
- . 1955. "The Interpretation of Nature and the Psyche."
<https://philpapers.org/rec/JUNTIO-6>.
- . 1963. "Foreword." In *Apparitions and Precognition: A Study from the Point of View of C.G. Jung's Analytical Psychology*. University Books.
- Kauffman, Stuart A. 1993. *The Origins of Order: Self-Organization and Selection in Evolution*. New York, NY: Oxford University Press.
[https://books.google.com/books?hl=en&lr=&id=lZcSpRjz0dgC&oi=fnd&pg=PR13&dq=Kauffman,+S.+\(1993\).+The+Origins+of+Order:+Self-Organization+and+Selection+in+Evolution.+Oxford+University+Press&ots=90Dli_5POr&sig=S5ZUECYTjIhVWipUaceQNM2jOYI](https://books.google.com/books?hl=en&lr=&id=lZcSpRjz0dgC&oi=fnd&pg=PR13&dq=Kauffman,+S.+(1993).+The+Origins+of+Order:+Self-Organization+and+Selection+in+Evolution.+Oxford+University+Press&ots=90Dli_5POr&sig=S5ZUECYTjIhVWipUaceQNM2jOYI).
- Kuhn, Thomas S., and David Hawkins. 1963. "The Structure of Scientific Revolutions." *American Journal of Physics* 31 (7): 554–55. <https://doi.org/10.1119/1.1969660>.
- Laszlo, Ervin. 2007. *Science and the Akashic Field: An Integral Theory of Everything*. 2nd ed. Inner Traditions International.

- [https://books.google.com/books?hl=en&lr=&id=gV4oDwAAQBAJ&oi=fnd&pg=PT11&dq=L%C3%A1szl%C3%B3,+E.+\(2007\).+Science+and+the+Akashic+Field:+An+Integral+Theory+of+Everything&ots=XH5z1C3O5j&sig=IBTSVFPn2mnuKyxZ9H9yKs_NM](https://books.google.com/books?hl=en&lr=&id=gV4oDwAAQBAJ&oi=fnd&pg=PT11&dq=L%C3%A1szl%C3%B3,+E.+(2007).+Science+and+the+Akashic+Field:+An+Integral+Theory+of+Everything&ots=XH5z1C3O5j&sig=IBTSVFPn2mnuKyxZ9H9yKs_NM).
- Laughlin, R. B. 2005. *A Different Universe: Reinventing Physics from the Bottom Down*. Basic Books.
- Levin, Michael. 2019. "The Computational Boundary of a 'Self': Developmental Bioelectricity Drives Multicellularity and Scale-Free Cognition." *Frontiers in Psychology* 10 (December):2688. <https://doi.org/10.3389/fpsyg.2019.02688>.
- . 2021. "Life, Death, and Self: Fundamental Questions of Primitive Cognition Viewed through the Lens of Body Plasticity and Synthetic Organisms." *Biochemical and Biophysical Research Communications* 564 (July):114–33. <https://doi.org/10.1016/j.bbrc.2020.10.077>.
- . 2022. "Technological Approach to Mind Everywhere: An Experimentally-Grounded Framework for Understanding Diverse Bodies and Minds." *Frontiers in Systems Neuroscience* 16 (March):768201. <https://doi.org/10.3389/fnsys.2022.768201>.
- Levin, Michael, and Christopher J. Martyniuk. 2018. "The Bioelectric Code: An Ancient Computational Medium for Dynamic Control of Growth and Form." *Bio Systems* 164 (February):76–93. <https://doi.org/10.1016/j.biosystems.2017.08.009>.
- Liu, Xiang, Yan Gong, Zebin Jiang, Trevor Stevens, and Wen Li. 2024. "Flexible High-Density Microelectrode Arrays for Closed-Loop Brain–machine Interfaces: A Review." *Frontiers in Neuroscience* 18 (April). <https://doi.org/10.3389/fnins.2024.1348434>.
- Lommel, P. van, R. van Wees, V. Meyers, and I. Elfferich. 2001. "Near-Death Experience in Survivors of Cardiac Arrest: A Prospective Study in the Netherlands." *Lancet* 358 (9298): 2039–45. [https://doi.org/10.1016/S0140-6736\(01\)07100-8](https://doi.org/10.1016/S0140-6736(01)07100-8).
- Löwdin, P. 1966. "Quantum Genetics and the Aperiodic Solid. Some Aspects on the Biological Problems of Heredity, Mutations, Ageing, and Tumors in View of the Quantum Theory of the DNA Molecule." *Advances in Quantum Chemistry* 2:213–360. [https://doi.org/10.1016/S0065-3276\(08\)60076-3](https://doi.org/10.1016/S0065-3276(08)60076-3).
- Löwdin, Per-Olov. 1963. "Proton Tunneling in DNA and Its Biological Implications." *Reviews of Modern Physics* 35 (3): 724–32. <https://doi.org/10.1103/revmodphys.35.724>.
- Mandelbrot, Benoit B. 1982. *The Fractal Geometry of Nature*. W.H. Freeman and Company.
- May, E. C., and S. B. Marwaha. 2017. *The Star Gate Archives: Reports of the United States Government Sponsored Psi Program, 1972-1995. Volume 2: Remote Viewing, 1985-1995*. Edited by Edwin C. May. Jefferson, NC: McFarland. [https://books.google.com/books?hl=en&lr=&id=mbylDwAAQBAJ&oi=fnd&pg=PP1&dq=May+%26+Marwaha+\(2018\).+The+Star+Gate+Archives&ots=fcJMIMEwOP&sig=v0eh0CAIw_5hwCKLrntKHG4enGo](https://books.google.com/books?hl=en&lr=&id=mbylDwAAQBAJ&oi=fnd&pg=PP1&dq=May+%26+Marwaha+(2018).+The+Star+Gate+Archives&ots=fcJMIMEwOP&sig=v0eh0CAIw_5hwCKLrntKHG4enGo).
- Meck, W. 1996. "Neuropharmacology of Timing and Time Perception." *Brain Research. Cognitive Brain Research* 3 (3): 227–42. [https://doi.org/10.1016/0926-6410\(96\)00009-2](https://doi.org/10.1016/0926-6410(96)00009-2).
- Miller, Iona, Richard A. Miller, and Burt Webb. 2011. "Quantum Bioholography." *DNA Decipher Journal* 1 (2). <https://dnadecipher.com/index.php/ddj/article/view/10>.
- Miller, R. A. 1972. "The Holographic Concept of Reality." In *Omniversal Symposium*. California State College, Sonoma, September 29, 1972.
- Miller, Richard A., and Burt Webb. 1972, 2002. "Embronic Holography: An Application of the Holographic Concept of Reality." *DNA Decipher Journal* 2 (2). <http://www.dnadecipher.com/index.php/ddj/article/view/26>.
- Montagnier, L., J. Aïssa, E. Del Giudice, C. Lavalée, A. Tedeschi, and G. Vitiello. 2011. "DNA Waves and Water." *Journal of Physics. Conference Series* 306 (1): 012007. <https://doi.org/10.1088/1742-6596/306/1/012007>.
- Montagnier, Luc, Jamal Aïssa, Stéphane Ferris, Jean-Luc Montagnier, and Claude Lavallée. 2009. "Electromagnetic Signals Are Produced by Aqueous Nanostructures Derived from Bacterial DNA Sequences." *Interdisciplinary Sciences, Computational Life Sciences* 1 (2):

- 81–90. <https://doi.org/10.1007/s12539-009-0036-7>.
- Montagnier, Luc, Emilio Del Giudice, Jamal Aïssa, Claude Lavalée, Steven Motschwiller, Antonio Capolupo, Albino Polcari, Paola Romano, Alberto Tedeschi, and Giuseppe Vitiello. 2015. “Transduction of DNA Information through Water and Electromagnetic Waves.” *Electromagnetic Biology and Medicine* 34 (2): 106–12. <https://doi.org/10.3109/15368378.2015.1036072>.
- Moody, Raymond. 2011. *Glimpses of Eternity: An Investigation into Shared Death Experiences*. London, England: Rider. <https://www.amazon.com/Glimpses-Eternity-Investigation-Shared-Experiences/dp/1846042534>.
- Mørch, H. H. 2020. “The Evolutionary Argument for Panpsychism.” In *The Routledge Handbook of Panpsychism*, edited by W. Seager, 348–59. New York: Routledge.
- Moreira-Almeida, Alexander, Francisco Lotufo Neto, and Etzel Cardeña. 2008. “Comparison of Brazilian Spiritist Mediumship and Dissociative Identity Disorder.” *The Journal of Nervous and Mental Disease* 196 (5): 420–24. <https://doi.org/10.1097/nmd.0b013e31816ff3a1>.
- Mossbridge, Julia, Patrizio Tressoldi, and Jessica Utts. 2012. “Predictive Physiological Anticipation Preceding Seemingly Unpredictable Stimuli: A Meta-Analysis.” *Frontiers in Psychology* 3 (October):390. <https://doi.org/10.3389/fpsyg.2012.00390>.
- Nelson, R. D. 2002. “Coherent Consciousness and Reduced Randomness: Correlations on September 11, 2001.” *Journal of Scientific Exploration* 16 (4): 549–70. <http://162.245.217.131/papers/jseNelson.pdf>.
- Nestler, Eric J., and Christian Lüscher. 2019. “The Molecular Basis of Drug Addiction: Linking Epigenetic to Synaptic and Circuit Mechanisms.” *Neuron* 102 (1): 48–59. <https://doi.org/10.1016/j.neuron.2019.01.016>.
- Parnia, Sam, Ken Spearpoint, Gabriele de Vos, Peter Fenwick, Diana Goldberg, Jie Yang, Jiawen Zhu, et al. 2014. “AWARE-Awareness during Resuscitation-a Prospective Study.” *Resuscitation* 85 (12): 1799–1805. <https://doi.org/10.1016/j.resuscitation.2014.09.004>.
- Peng, C. K., S. V. Buldyrev, A. L. Goldberger, S. Havlin, F. Sciortino, M. Simons, and H. E. Stanley. 1992. “Long-Range Correlations in Nucleotide Sequences.” *Nature* 356 (6365): 168–70. <https://doi.org/10.1038/356168a0>.
- Playfair, G. L. 2002. “Twin Telepathy: The Psychic Connection.”
- Prasad, Deepasri, and Wilma A. Bainbridge. 2022. “The Visual Mandela Effect as Evidence for Shared and Specific False Memories across People.” *Psychological Science* 33 (12): 1971–88. <https://doi.org/10.1177/09567976221108944>.
- Pribram, Karl H. 1987. “The Implicate Brain.” In *Quantum Implications: Essays in Honour of David Bohm*, edited by Basil J. Hiley and F. David Peat, 365–71. Routledge.
- . 1991. *Brain and Perception: Holonomy and Structure in Figural Processing*. Distinguished Lecture Series. London, England: Psychology Press. <https://doi.org/10.4324/9780203728390>.
- Pritchard, W. S. 1992. “The Brain in Fractal Time: 1/f-like Power Spectrum Scaling of the Human Electroencephalogram.” *The International Journal of Neuroscience* 66 (1-2): 119–29. <https://doi.org/10.3109/00207459208999796>.
- Radin. 2018. *Real Magic: Unlocking Your Natural Psychic Abilities to Create Everyday Miracles*. New York, NY: Listening Library. <https://www.amazon.com/Real-Magic-Ancient-Science-Universe/dp/1524758825>.
- . 2024. *Radin*. <https://youtu.be/lbkMmVBdshA?si=Opv-9rB0vYiEra2r>.
- Radin, D., L. Michel, and A. Delorme. 2016. “Psychophysical Modulation of Fringe Visibility in a Distant Double-Slit Optical System.” *Physics Essays* 29 (1): 14–22.
- Ritz, Thorsten, Peter Thalau, John B. Phillips, Roswitha Wiltschko, and Wolfgang Wiltschko. 2004. “Resonance Effects Indicate a Radical-Pair Mechanism for Avian Magnetic Compass.” *Nature* 429 (6988): 177–80. <https://doi.org/10.1038/nature02534>.

- Rubik, Beverly, David Muehsam, Richard Hammerschlag, and Shamini Jain. 2015. "Biofield Science and Healing: History, Terminology, and Concepts." *Global Advances in Health and Medicine* 4 (Suppl): 8–14. <https://doi.org/10.7453/gahmj.2015.038.suppl>.
- Savelev, Ivan Viktorovich, Richard Alan Miller, and Max Myakishev-Rempel. 2022. "How the Biofield Is Created by DNA Resonance." In *Rhythmic Advantages in Big Data and Machine Learning*, 161–99. Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-16-5723-8_7.
- Schrödinger, E., and Ian G. Barbour. 1959. "Mind and Matter." *American Journal of Physics* 27 (October): 529–529. <https://doi.org/10.1119/1.1996230>.
- Sheldrake, R. 1996. "Seven Experiments That Could Change the World." *Complementary Health Practice Review* 2 (2): 93–99. <https://doi.org/10.1177/153321019600200204>.
- . 2009. *A New Science of Life: The Hypothesis of Formative Causation*. Rochester, VT: Park Street Press.
- Sheldrake, Rupert. 2009. *Morphic Resonance: The Nature of Formative Causation*. Inner Traditions / Bear & Co. <https://play.google.com/store/books/details?id=F75gxeTBgocC>.
- . 2012. *The Science Delusion: Feeling the Spirit of Enquiry*. London, England: Coronet Books. https://www.amazon.com/SCIENCE-DELUSION-SHELDRAKE-RUPERT-Paperback/dp/B009216GLS?crd=2ABNJHYN4ZROB&dib=eyJ2IjoiMSJ9.aBTFCv9EMqEfepBpISbv7rVbtwITBbYOUhhNywXzgpHP5cKgObWdxhDAQyhaLpclHuoEs1KE8maZ-qa9hMZrValVv7OHu5kwVZmZtbyioY1aaP9BZjWQfRrA_Qulb2IHRAcVmpy8uzEMA4PFk0ICFRLxkykti38ZHKEKc_cDsNX-CSKZaOL2FD6n4RfHPI2l.5mTeR1Zaxd_TMbozkpNctJ0nJlzAQJh14tp8iaKS8y0&dib_tag=se&keywords=sheldrake+science+delusion&qid=1733092196&srefix=sheldrake+science+delusion%2Caps%2C183&sr=8-2.
- . 2013. *The Sense of Being Stared at: And Other Unexplained Powers of Human Minds*. Simon and Schuster.
- Sheldrake, Rupert, and Pamela Smart. 2000. "A Dog That Seems to Know When His Owner Is Coming Home: Videotaped Experiments and Observations." *Journal of Scientific Exploration* 14:233–55.
- Silberstein, Richard B., and Felicity J. Bigelow. 2024. "Brain Functional Connectivity Correlates of Anomalous Interaction between Sensorily Isolated Monozygotic Twins." *Frontiers in Human Neuroscience* 18 (April): 1388049. <https://doi.org/10.3389/fnhum.2024.1388049>.
- Stark, Eran, Amir Levi, and Horacio G. Rotstein. 2022. "Network Resonance Can Be Generated Independently at Distinct Levels of Neuronal Organization." *PLoS Computational Biology* 18 (7): e1010364. <https://doi.org/10.1371/journal.pcbi.1010364>.
- Stark, Eran, and Horacio G. Rotstein. 2020. "Neuronal Resonance Can Be Generated Independently at Distinct Levels of Organization." *Neuroscience*. bioRxiv. <https://www.biorxiv.org/content/10.1101/2020.05.26.117309v1.full>.
- Thomson, J. Arthur. 1917. "On Growth and Form." *Nature* 100 (2498): 21–22. <https://doi.org/10.1038/100021a0>.
- Utts, J. 1995. "An Assessment of the Evidence for Psychic Functioning." *The Journal of Parapsychology*. <http://www.ics.uci.edu/~jutts/air.pdf>.
- Velasco, Cecilia D., Rachel Santarella-Mellwig, Martin Schorb, Li Gao, Oliver Thorn-Seshold, and Artur Llobet. 2023. "Microtubule Depolymerization Contributes to Spontaneous Neurotransmitter Release in Vitro." *Communications Biology* 6 (1): 488. <https://doi.org/10.1038/s42003-023-04779-1>.
- Vikhorev, Aleksandr V., Ivan V. Savelev, Oksana O. Poleskaya, Michael M. Rempel, Richard A. Miller, Alexandre A. Vetcher, and Max Myakishev-Rempel. 2024. "The Avoidance of Purine Stretches by Cancer Mutations." *International Journal of Molecular Sciences* 25 (20): 11050. <https://doi.org/10.3390/ijms252011050>.
- Vitiello, Giuseppe. 2001. "My Double Unveiled."

- <https://www.torrossa.com/gs/resourceProxy?an=5000851&publisher=FZ4850>.
- V. Savelyev, Ivan, Nelli V. Zyryanova, Oksana O. Poleskaya, and Max Myakishev-Rempel. 2019. "On the Existence of the DNA Resonance Code and Its Possible Mechanistic Connection to the Neural Code." *NeuroQuantology: An Interdisciplinary Journal of Neuroscience and Quantum Physics* 17 (2). <https://doi.org/10.14704/nq.2019.17.2.1973>.
- Wahbeh, Helané, Dean Radin, Garret Yount, Michael A. Woodley Of Menie, Matthew A. Sarraf, and Marcela V. Karpuj. 2022. "Genetics of Psychic Ability - A Pilot Case-Control Exome Sequencing Study." *Explore (New York, N.Y.)* 18 (3): 264–71. <https://doi.org/10.1016/j.explore.2021.02.014>.
- Wheeler, J. A. 1978. "The 'Past' and the 'Delayed-Choice' Double-Slit Experiment." In *Mindful Universe: Quantum Mechanics and the Participating Observer*, 9–48. Springer-Verlag.
- Wheeler, John Archibald. 1983. ""On Recognizing 'law without Law,' "" Oersted Medal Response at the Joint APS–AAPT Meeting, New York, 25 January 1983." *American Journal of Physics* 51 (5): 398–404. <https://doi.org/10.1119/1.13224>.