UNIVERSITY OF TURKU

Spacetime and the Dream of Consciousness

Relational Ontology and Quantum Theories of Mind

Department of Computing

Master's thesis

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14.11.2025

Turku

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Subject: Master's thesis
Author: Niko Jokela
Title: Spacetime and the Dream of Consciousness: Relational Ontology and Quantum Theories of Mind
Supervisors: Dr. Jukka Heikkonen, Dr. Erkki Sutinen
Number of pages: 69 pages
Date: 14.11.2025

This thesis addresses the mystery of consciousness and the perceived lack of meaning in science, exploring how these themes are intertwined. It investigates whether consciousness is best understood as a fundamental feature of reality rather than as a byproduct of the brain—an inquiry framed by the long-standing debate between idealism and materialism. Various anomalous and so-called paranormal phenomena are considered as indications that idealist interpretations may provide a stronger explanatory framework.

Drawing on both scientific and philosophical theories, the thesis examines how quantum mechanics—particularly Carlo Rovelli's relational interpretation—can be understood as reflecting attributes of consciousness itself. This relational perspective has already gained traction in contemporary science, and it resonates with historical and modern forms of idealism, which regard the universe and its laws as emerging from a fundamental substrate of consciousness.

The thesis engages with recent proposals in idealist and quantum consciousness research, including the work of Donald Hoffman, Federico Faggin, Mauro D'Ariano, and Stuart Hameroff and Roger Penrose. Building on these insights, it develops a new synthesis that seeks to unify aspects of quantum mechanics, idealism, and materialism into a coherent theoretical framework.

This synthesis portrays spacetime as akin to a dream, with living beings as the dreamers who both generate and inhabit it. From this perspective, the logic of the world resembles dream logic, where appearances are not what they seem but conceal deeper relations, and where meaning is grounded in how reality is felt rather than how it merely appears. The thesis concludes that such a view offers a paradigm capable of restoring meaning to scientific inquiry while deepening our understanding of consciousness and reality.

Key words: Consciousness Studies, Idealism, Materialism, Relational Quantum Mechanics, Quantum Consciousness, Dreams

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1 Introduction

I am a student of computer science, but this thesis reaches far beyond the boundaries of my field. It explores topics from physics, philosophy, and consciousness studies, many of which lie outside the standard curriculum. I like to think of it as a journey — sometimes wild — into some of the deepest and most fundamental questions we can ask. The work culminates in my own philosophical framework, strongly inspired by existing thinkers but ultimately woven into a synthesis that is both original and, admittedly, a little strange.

This is, above all, a passion project. It stems from my long-time hobby of studying quantum physics, general relativity, consciousness, paranormal and psi phenomena, and other mysteries. In recent years, I have also felt motivated to make sense of the growing, often sensational, discussion about conscious artificial intelligence—a topic that raises profound questions about the nature of awareness itself. Over the years I have spent well over a thousand hours following lectures, interviews, and discussions on these subjects. I am not an expert in any of them, but I believe I have developed a broad general understanding that allows me to see connections others may overlook. Through continuous reflection and study, I have gradually distilled these diverse interests into the central themes explored in this thesis.

One difficulty with this approach is that listening and reflecting are not the same as writing. Much of my understanding has come from following countless lectures, interviews, and discussions—forms of learning that do not easily translate into properly cited academic text. To bridge that gap, I have made extensive use of artificial intelligence and large language models, specifically the free versions of ChatGPT (model 4o and, later, model 5). This feels appropriate, given that my main area of study is machine learning and natural language technology. In practice, GPT helped me transform intuitive, audio-based insights into coherent written arguments and locate relevant academic references to ground them. I do not see this as outsourcing my work, but rather as participating in a new form of collaboration between human and machine. I provide the ideas, structure, and direction, while GPT assists in articulating and refining them—a process I believe may soon become a natural extension of academic writing itself.

Chapters 2, 3, 4, and 5 primarily employ GPT's help to summarize and synthesize material I selected as important. Chapters 1, 6, and 7, by contrast, are more personal and interpretative: I first drafted these sections myself and then used GPT to refine their tone, coherence, and academic style. I was genuinely impressed by how effectively GPT could interpret my stream of thought and articulate it in a more formal and coherent way. To a discerning reader, differences in tone or phrasing may reveal where AI assistance was more prominent, yet I regard this as part of the thesis's character—an experiment in merging human intuition with linguistic precision.

Overall, I am very satisfied with the assistance provided by ChatGPT. One notable characteristic of the model is its consistently positive and supportive tone, which can sometimes be overly flattering. While this friendliness is helpful for motivation, it can also misdirect thinking if one is not careful to critically evaluate suggestions. The greatest challenge, however, was sourcing appropriate references. While GPT can propose citations, these are unreliable — sometimes hallucinated, misattributed, or drawn from non-academic sources such as Wikipedia or online forums. Consequently, assembling a credible reference list required extensive manual verification and cross-checking. Although slow and labour-intensive, this process ultimately yielded a solid foundation for the arguments presented in this thesis.

1.1 Research Motivation

The nature of reality has long been a central question in both science and philosophy. Modern physics, particularly quantum mechanics and quantum field theory, has revealed a universe far stranger than our everyday intuition suggests. Particles exist in superposition, properties depend on measurement, and spacetime itself may be emergent rather than fundamental.

Since Galileo, science has deliberately focused on measurable, quantitative aspects of the world—shape, motion, and number—while setting aside qualitative experiences such as colour, taste, and feeling. As Philip Goff argues in Galileo's Error (Goff, 2019), this strategic omission allowed science to achieve objectivity and predictive power but created a worldview disconnected from consciousness and meaning. By ignoring the subjective dimension of reality, traditional science explains how things happen but not why they matter to conscious beings. This foundational limitation motivates the exploration of relational quantum mechanics, consciousness, and the deeper structure of reality throughout this thesis.

This thesis investigates the deep connections between the structure of the physical universe and the nature of consciousness. It explores how spacetime, quantum mechanics, and the laws of physics may emerge from relational structures, and how consciousness may itself be a fundamental, irreducible aspect of reality. In doing so, it considers both materialist accounts, which attempt to reduce mind to matter, and idealist perspectives, which propose that consciousness is primary. Bridging these approaches, the thesis also examines anomalous phenomena—telepathy, precognition, and other psi experiences—that challenge strictly materialist accounts, suggesting that mind and matter are intertwined in ways science has yet to fully grasp.

1.2 Philosophical and Conceptual Foundations

The question of consciousness as a fundamental aspect of reality has a long philosophical lineage. Classical idealists, from Plato with his Theory of Forms (Plato, 1992) to Leibniz with his monads (Leibniz, 1714/1989), proposed that the material world reflects deeper, non-physical structures of mind or experience. These ideas posited that the apparent physicality of the universe is underpinned by relational patterns of consciousness, a perspective that resonates with certain modern interpretations of physics.

In contemporary philosophy and cognitive science, this idealist tradition has been extended and formalized. Donald Hoffman, for example, has argued that perception constructs a user-interface-like reality optimized for survival, rather than reflecting an objective physical world (Hoffman et al., 2015), while Bernardo Kastrup has proposed that all experiences emerge from a single universal consciousness (Kastrup, 2019a). Similarly, Federico Faggin has explored consciousness as a fundamental ontological category, suggesting that mind is not reducible to matter (Faggin, 2024). These approaches have gained renewed attention as quantum mechanics, with its non-commutative observables, entanglement, and context-dependent properties, has highlighted the limits of purely materialist descriptions of reality.

On the scientific side, research into quantum consciousness—exemplified by Penrose and Hameroff's Orch OR model—proposes that certain quantum processes in neural microtubules may play a role in conscious experience, offering a tangible, albeit controversial, connection between quantum phenomena and mental states (S. Hameroff & Penrose, 1996, 2014a). Collectively, these philosophical and scientific developments demonstrate that the last few decades have seen a serious and growing interest in frameworks that place consciousness at the heart of reality, linking it directly to the strange, counterintuitive features of the quantum world.

1.3 Research Questions and Objectives

This thesis is not an empirical study in the traditional sense but a conceptual exploration that moves across the boundaries of physics, philosophy, and consciousness studies. Rather than beginning with fixed hypotheses, it emerged through years of reflection on the deep connections between mind and matter. Its aim is to explore whether consciousness might not be a byproduct of physical processes but instead a fundamental feature of reality—interwoven with the relational structures described by quantum mechanics.

The inquiry has been guided by several recurring themes and questions that have naturally arisen during this exploration:

Quantum mechanics. How do modern interpretations of quantum mechanics, particularly relational quantum mechanics, reshape our understanding of the relationship between mind and matter?

Idealism. In what ways can historical and contemporary idealist philosophies contribute to a coherent framework in which consciousness is ontologically primary?

Paranormal experiences. Can anomalous experiences—telepathy, precognition, and other psi phenomena—be integrated into a broader scientific worldview without reductionism or dismissal?

Unification. What kind of synthesis might reconcile the rigor of physics with the irreducible presence of conscious experience?

The overarching objective is to propose such a synthesis. Drawing inspiration from historical idealist theories and from modern perspectives such as D'Ariano and Faggin's quantum information theory of consciousness (D'Ariano & Faggin, 2021) and Rovelli's relational quantum mechanics (Rovelli, 1996), I advance a philosophical framework in which we are both dreamers and inhabitants of the universe. In this view, the dreamer and the dream are ultimately one: consciousness gives rise to reality, and reality, in turn, reflects the structures of consciousness. The framework envisions the universe as a network of conscious agents defined by relations, with physical laws emerging as patterns within this network. While speculative, the approach is grounded in existing philosophical and scientific discourse and seeks to bridge intuitive insight with analytical reasoning in pursuit of a unified understanding of reality.

1.4 Structure of the Thesis

The thesis proceeds from scientific foundations, through philosophical analysis, to the development of an original framework.

Chapter 2 provides the scientific background, reviewing quantum mechanics, quantum field theory, and the standard model, while highlighting their limitations. It also surveys candidate theories of everything and explores how spacetime and physical laws may emerge from deeper relational structures.

Chapter 3 examines relationality in the universe, addressing quantum conceptual challenges, introducing Rovelli's relational quantum mechanics, and highlighting mathematical formalisms that emphasize relations over isolated entities.

Chapter 4 investigates consciousness. It reviews materialist and idealist perspectives and considers paranormal and anomalous experiences that challenge strictly materialist accounts.

Chapter 5 develops idealist and quantum approaches to consciousness, tracing historical and modern thinkers—from Plato and Leibniz to Hoffman, Kastrup, Faggin, and Penrose/Hameroff—and situates consciousness as a fundamental aspect of reality.

Chapter 6 presents my own synthesis. It explores the interplay of consciousness and physical structures, examines how ideas and quantum phenomena manifest in the world, and proposes a speculative framework for understanding reality's ultimate building blocks.

Chapter 7 concludes the thesis by reflecting on the connections between consciousness and relational structures, emphasizing the integration of subjective experience with scientific and philosophical perspectives.

2 The Universe is Emergent

This chapter explores the idea that the fundamental structures of reality—space, time, and even quantum mechanics—may not be primary but rather arise from deeper principles. Beginning with the established framework of quantum mechanics, quantum field theory, and the standard model, we then consider ongoing attempts at formulating a 'theory of everything.' From there, we turn to more recent perspectives suggesting that spacetime and quantum laws themselves could be emergent phenomena, shaped by underlying relational or informational processes. This provides a conceptual foundation for rethinking what it means for the universe to exist and evolve.

2.1 Laws of the Universe

Quantum Mechanics (QM) is the most successful and experimentally verified physical theory, providing a framework for describing atomic and subatomic phenomena. It underpins technologies such as semiconductors, lasers, and quantum computers. Developed in the early 20th century, QM fundamentally reshaped our understanding of nature, replacing classical determinism with a probabilistic framework (Shankar, 2014).

2.1.1 Quantum Mechanics: Historical Context

QM emerged to address phenomena that classical physics could not explain, revealing that energy, light, and matter behave in fundamentally discrete and probabilistic ways. By "classical physics," we mean the set of theories developed before QM, including Newtonian mechanics, Maxwell's electromagnetism, and thermodynamics, which describe macroscopic objects and continuous phenomena with deterministic laws. Classical physics works extremely well for everyday experiences, but it fails to describe the behaviour of atoms, photons, and subatomic particles. (Tipler & Llewellyn, 2012)

Blackbody radiation: Classical physics predicted that objects should emit infinite energy at high frequencies, a problem known as the ultraviolet catastrophe. Planck resolved this by proposing that energy is emitted in discrete packets, or quanta, introducing the concept of energy quantization (Planck, 1901).

Photoelectric effect: Experiments showed that shining light on a metal can eject electrons, but only if the light exceeds a certain frequency. Einstein explained this by suggesting that light itself is made of discrete photons, each carrying a specific energy (Einstein, 1905).

Atomic spectra: Atoms emit light only at specific wavelengths, producing discrete spectral lines. Bohr proposed that electrons occupy quantized orbits, and energy is emitted or absorbed when electrons jump between these orbits, explaining the observed spectra (Bohr, 1913).

Wave-particle duality: de Broglie proposed that particles, like electrons, can exhibit wave-like behaviour, introducing the revolutionary idea that matter and energy share both particle and wave properties (De Broglie, 1925).

Wave mechanics: Schrödinger developed a wave equation describing how the quantum state of a system evolves over time. This allowed physicists to calculate probabilities for where particles are likely to be found (Schrödinger, 1926).

Matrix mechanics and the uncertainty principle: Heisenberg formulated an alternative approach using matrices and showed that certain pairs of properties, like position and momentum, cannot be simultaneously known with arbitrary precision, a fundamental limit on measurement (Heisenberg, 1927).

These breakthroughs collectively demonstrated that the microscopic world is probabilistic, discrete, and fundamentally different from classical intuition. Together, they laid the foundation for the Copenhagen interpretation, which emphasizes that quantum outcomes are defined by measurements and interactions with observers, rather than existing as predetermined properties (Bohr, 1935).

2.1.2 Mathematical Formalism

QM describes physical systems in terms of states and observables (Schrödinger, 1926). You can think of a state as a kind of "information container" that encodes all possible behaviours of the system.

A quantum state contains all the information about a system, like how a data structure in programming contains all the relevant information about an object. Unlike classical states, a quantum state can represent multiple possibilities at once, a property called superposition (Nielsen & Chuang, 2010).

Observables are physical quantities we can measure, such as position, momentum, or spin (Dirac, 1930/2010). Measuring a quantum system "extracts" one value from the possibilities encoded in the state, somewhat like reading a variable from a data structure.

Quantum systems evolve over time according to precise rules (the Schrödinger equation) (Schrödinger, 1926), analogous to a deterministic update function applied to the state.

The Born rule tells us how to calculate probabilities: the quantum state encodes not a single outcome but a probability distribution over all possible outcomes (Born, 1926).

In short, QM provides a framework for representing, evolving, and extracting information from physical systems, where information behaves very differently from classical intuition (Nielsen & Chuang, 2010).

2.1.3 Quantum Fields and the Standard Model

While QM successfully describes atoms and molecules, it does not account for relativistic effects — the fact that space and time are interconnected and that objects can move near the speed of light — nor does it handle particle creation and annihilation, which are crucial in high-energy physics. To address these limitations, physicists developed Quantum Field Theory (QFT) (Peskin & Schroeder, 1995).

As Weinberg (1995/2014) explains, in QFT, the fundamental entities are fields that permeate spacetime, rather than individual particles. You can think of a field like a digital grid covering space, where each point can store excitations. Particles appear as ripples or "excitations" in these fields — like waves appearing on a water surface. Forces arise from interactions between these fields, often mediated by particles called gauge bosons (like photons for electromagnetism or gluons for the strong force).

QFT also introduced sophisticated mathematical tools, such as renormalization, to make sense of calculations that initially produce infinite results. Despite the technical complexity, QFT has been extraordinarily successful, producing extremely precise predictions for particle behaviour, including the electron's magnetic moment and particle scattering experiments.

The Standard Model (SM) is the most complete framework built from QFT. It unifies three of the four known fundamental forces:

Electromagnetism, carried by photons.

Strong nuclear force, carried by gluons, which binds quarks inside protons and neutrons.

Weak nuclear force, responsible for certain types of radioactive decay, unified with electromagnetism in the electroweak theory.

Together, these forces and the particles that experience them describe almost all known matter in the universe. The SM has been extensively confirmed by experiments, including the discovery of the W and Z bosons and the Higgs boson (ATLAS Collaboration, 2012)

2.1.4 Limitations of the Standard Model

Although the SM has been experimentally verified to an extraordinary degree, it is incomplete and leaves several fundamental questions unanswered:

Gravity: The SM does not incorporate general relativity, which describes gravity as the curvature of spacetime caused by mass and energy. Integrating gravity with quantum theory remains a major challenge (Kiefer, 2025).

Dark matter and dark energy: Observations suggest that about 95 % of the universe consists of unknown forms of matter and energy that the SM cannot account for (Arun et al., 2017)

Matter–antimatter asymmetry: The SM cannot fully explain why the observable universe is dominated by matter, rather than having equal amounts of matter and antimatter (Riotto & Trodden, 1999).

These gaps motivate the search for theories beyond the SM, ranging from frameworks that unify forces, like string theory, to approaches attempting to describe spacetime itself, such as loop quantum gravity. More recently, geometric formulations like the amplituhedron have provided elegant ways to compute particle interactions and hint at deeper structures underlying physical laws (Arkani-Hamed & Trnka, 2014).

2.2 Theories of Everything

The search for a Theory of Everything (TOE) arises from the desire to describe all fundamental forces and particles in a single, unified framework. The SM successfully describes electromagnetic, weak, and strong interactions, but it fails to incorporate gravity and cannot account for dark matter, dark energy, or the origin of fundamental constants. TOEs aim to bridge this gap, reconciling QM with general relativity and providing a more fundamental understanding of physical law (Greene, 1999; Weinberg, 1995/2014).

General relativity (GR) models gravity as the curvature of spacetime caused by mass and energy, excelling at describing large-scale structures like stars, galaxies, and black holes

(Einstein, 1916). In contrast, QM governs the probabilistic behaviour of particles at the smallest scales and forms the basis of QFT, which underpins the SM (Weinberg, 1995/2014).

Attempts to directly quantize gravity using QFT encounter severe problems: gravity as a quantum field is non-renormalizable, meaning calculations lead to infinities that cannot be absorbed into a finite set of physical constants (Goroff & Sagnotti, 1985). This conceptual mismatch motivates alternative approaches that aim to unify all interactions in a consistent framework.

String theory replaces point-like particles with tiny, vibrating strings, whose vibrational modes correspond to different particles. Among these modes is the *graviton* — the hypothetical quantum carrier of gravity — suggesting that string theory naturally unifies quantum mechanics and general relativity within the same formalism. String theory requires additional spatial dimensions and often invokes supersymmetry to remain consistent (Green et al., 1987; Polchinski, 1998). Despite its mathematical elegance, the theory faces the so-called landscape problem, reflecting the vast number (~10^500) of possible vacuum solutions (Susskind, 2003). Conceptually, string theory suggests that the properties of particles and forces are determined by the geometry and topology of higher-dimensional space (Polchinski, 1998).

Loop Quantum Gravity (LQG) focuses on quantizing spacetime itself, using a background-independent approach derived from canonical quantization of GR. It predicts that space is composed of discrete units at the Planck scale, often described as spin networks, which provide a combinatorial description of quantum geometry. Unlike string theory, LQG does not attempt to unify all forces but aims to provide a consistent quantum theory of gravity (Rovelli & Smolin, 1995). However, a major critique is that LQG has not yet fully demonstrated how its discrete quantum structure recovers classical general relativity in appropriate low-energy limits, leaving open questions about the connection between the theory and observable spacetime (Rovelli, 2004).

Some developments emphasize the geometric structure underlying physical laws.

Twistor theory, proposed by Roger Penrose, reformulates physics using geometric objects called twistors, potentially unifying spacetime and quantum fields in a novel mathematical language (Penrose, 1967). While twistor theory offers a novel geometric formulation of physics, it has so far produced few experimentally testable predictions and remains mathematically abstract, limiting its direct application to physical phenomena (Penrose, 2004).

The amplituhedron represents a particularly striking example: it is a high-dimensional, abstract geometric shape whose volume directly encodes scattering amplitudes, the probabilities of particle interactions. Remarkably, the amplituhedron does not rely on classical spacetime, suggesting that spacetime and locality may emerge from deeper geometric principles (Arkani-Hamed & Trnka, 2014). This resonates with the idea that the fundamental structure of reality may be informational or relational, rather than based solely on particles and fields.

Despite challenges, string theory, LQG, and geometric approaches highlight a common insight: the universe may be fundamentally about structure, relations, and geometry, rather than individual particles or classical fields. This perspective lays the conceptual groundwork for later discussions on emergent laws, relational structures, and the potential role of consciousness in the fabric of reality.

2.3 Emergence

Modern physics increasingly suggests that spacetime may not be fundamental but instead arises from the underlying structure of quantum systems (Van Raamsdonk, 2010). In this view, space and time are emergent phenomena, like how temperature emerges from the collective motion of molecules.

A key ingredient in these ideas is quantum entanglement, a phenomenon in which particles become linked such that the state of one particle instantaneously informs the state of the other, regardless of distance. Entangled particles exhibit correlations that cannot be explained by classical physics alone (Nielsen & Chuang, 2010). Some researchers propose that these correlations could determine the very connectivity of space itself:

ER=EPR conjecture suggests that entangled particles might be connected by microscopic, wormhole-like links, implying that spatial connections are shaped by quantum relationships (Maldacena & Susskind, 2013). While these “wormholes” are not traversable and the proposal remains speculative, it highlights the deep connection between quantum information and geometry.

AdS/CFT correspondence, a framework part of the holographic principle in theoretical physics, shows that a quantum system defined on a lower-dimensional boundary can encode the geometry of a higher-dimensional spacetime (Maldacena, 1999). Conceptually, this suggests that the geometry of space could emerge from entanglement patterns in a quantum system, much like a hologram projects a three-dimensional image from a two-dimensional surface. While this insight is powerful, it remains largely theoretical: the correspondence has been rigorously formulated only for certain highly symmetric spacetimes, and its connection to our observable universe is still a subject of ongoing research (Van Raamsdonk, 2010). Furthermore, relating entanglement to emergent geometry is conceptually compelling but currently lacks direct experimental verification.

Categorical Quantum Mechanics (CQM) provides a mathematical framework to formalize these ideas. By focusing on processes and relationships rather than isolated objects, CQM offers a natural way to describe how spacetime, interactions, and even physical laws might emerge from networks of quantum interactions (Abramsky & Coecke, 2004).

Beyond these specific conjectures, other approaches emphasize relations and information as the foundation of physics. D'Ariano et al. (2017) have shown that quantum mechanics itself can be reconstructed from information-processing principles, hinting that physical laws might emerge from operational rules rather than pre-existing spacetime. Similarly, Carlo Rovelli's relational quantum mechanics proposes that the state of a system is only meaningful relative to other systems, suggesting that geometry and spacetime could arise as emergent structures from networks of relations (Rovelli, 1996).

In summary, the emergent perspective encourages a radical rethinking of spacetime: rather than being fundamental, it may arise from quantum entanglement and relational processes. Concepts like ER=EPR and AdS/CFT provide concrete ways to make this idea precise, while operational and relational approaches — exemplified by d'Ariano, Rovelli, and CQM — offer a broader conceptual foundation. This sets the stage for the next chapter, where the relational universe will be explored in more detail.

3 The Universe is Relational

In this chapter we examine how the deepest puzzles of quantum theory challenge the notion of an observer-independent reality. From paradoxes such as measurement, entanglement, and quantum thought experiments, we are led to consider interpretations that place relations, rather than objects, at the foundation of physics. Carlo Rovelli's relational quantum mechanics offers one such framework, suggesting that physical properties exist only in relation to other systems. Building on this, we turn to recent developments in mathematics—such as categorical quantum mechanics and homotopy type theory—that provide formal tools for understanding relationality as a fundamental organizing principle of the universe.

3.1 Quantum Mysteries and Conceptual Challenges

Quantum Mechanics (QM) is one of the most successful scientific theories ever developed, providing extraordinarily accurate predictions of microscopic phenomena. Yet, it remains conceptually puzzling, revealing deep mysteries about the nature of reality, measurement, and observation. These puzzles set the stage for relational approaches to physics, most notably Carlo Rovelli's relational quantum mechanics (RQM) (Rovelli, 1996).

Superposition and wave–particle duality. At the heart of QM is the principle of superposition: a quantum system can exist in multiple states simultaneously until a measurement collapses it to a definite outcome. This leads to famously counterintuitive phenomena, such as Schrödinger's cat, a thought experiment in which a cat in a sealed box is simultaneously alive and dead until observed (Schrödinger, 1935). Similarly, the double-slit experiment illustrates wave–particle duality: particles like electrons display interference patterns characteristic of waves when unobserved, but behave like discrete particles when measured (Feynman et al., 1965/2007).

The Measurement Problem. QM describes two types of evolution. Isolated systems evolve deterministically via the Schrödinger equation, while measurement seemingly produces probabilistic, discontinuous "collapses" of the wavefunction. This duality raises questions: what counts as a measurement, why does one outcome occur, and what mechanism selects it? Standard interpretations, such as the Copenhagen interpretation, invoke classical apparatus or observers, but leave these questions conceptually unresolved (Bell, 1990; Schlosshauer, 2005).

Entanglement and nonlocality. Quantum entanglement is a phenomenon where particles become interconnected in such a way that the state of one instantaneously influences the state of another, regardless of the distance separating them. This "spooky action at a distance," as Einstein famously termed it (Norsen, 2017), challenges our classical intuitions about separability and locality. Experiments have demonstrated that these correlations cannot be explained by any simple "pre-set" instructions or classical ideas of separate, independent objects (Aspect et al., 1982; Brunner et al., 2014).

Indeterminacy and non-commutativity. Quantum properties are intrinsically probabilistic and context dependent. Observables represented by non-commuting operators, such as position and momentum, obey the Heisenberg uncertainty principle: measuring one property alters the uncertainty in another. This emphasizes that physical quantities are not pre-existing, independent values but emerge through interactions (Heisenberg, 1927)

Reality of the wavefunction. A central debate in quantum foundations concerns whether the wavefunction represents physical reality or merely encodes knowledge about probabilities. The Everettian Many-Worlds interpretation posits that all possible outcomes occur in branching universes (Everett, 1957), whereas epistemic views treat the wavefunction as a calculational tool. The Pusey–Barrett–Rudolph theorem suggests that, under reasonable assumptions, the wavefunction must correspond to reality in some sense (Pusey et al., 2012).

Observer-dependent phenomena and quantum paradoxes. QM contains phenomena that highlight the limits of assuming observer-independent reality. For example, Wigner's friend illustrates a nested observer scenario: a friend measures a system inside a lab and observes a definite outcome, while an external observer still describes the lab as a superposition (Frauchiger & Renner, 2018; Wigner, 1961). Another striking case is the Elitzur–Vaidman bomb tester, in which the presence of a sensitive object can be inferred without interacting with it directly, demonstrating that information can emerge through potential interactions rather than physical contact (Elitzur & Vaidman, 1993). These paradoxes emphasize that "facts" in quantum mechanics are not absolute—they depend on which system performs the measurement and how the interaction unfolds.

Local realism and the nature of reality. Locality is the classical principle that objects are only influenced by their immediate surroundings, and no information or influence can travel faster than light. Realism is the assumption that physical properties exist independently of observation. Together, local realism posits that properties are absolute and local: they exist whether anyone observes them, and measurements on one system cannot instantaneously affect another distant system (Bell, 1964; Einstein et al., 1935; Norsen, 2017). Quantum entanglement experiments—including those recognized by the 2022 Nobel Prize (*The Nobel Prize in Physics*, 2022)—show that local realism is violated (Aspect et al., 1982; Bell, 1964; Hensen et al., 2015). Measurements on entangled particles produce correlations that cannot be explained if properties are both local and absolute. In other words, the properties of quantum systems are not pre-existing, observer-independent facts, and they can appear differently depending on the measurement context. Philosophically, this has profound implications: the universe is not "absolute." Classical intuitions like "this apple is red, and everyone would agree" break down. Instead, properties exist relative to interactions and observations. This relational view suggests that what we experience as the physical universe is a web of interdependent interactions (Rovelli, 1996), rather than a fixed set of absolute truths.

3.2 Relational Quantum Mechanics

Relational Quantum Mechanics (RQM), first articulated by Carlo Rovelli (Rovelli, 1996) and later popularized in Helgoland (Rovelli, 2021), offers a radical reinterpretation of quantum theory in which the properties of a system are never absolute but always defined relative to another system. Unlike interpretations that assume a universal, observer-independent wavefunction, RQM emphasizes that quantum states are meaningful only in the context of interactions between physical systems.

3.2.1 Core Principles

From this relational perspective, RQM can be understood through a set of interrelated principles that together distinguish it from other interpretations of quantum mechanics. The following principles clarify how interactions determine measurement outcomes, the ontological status of the wavefunction, and how different observers' accounts of the same event can coexist consistently:

Observer-relativity. In RQM, any physical system can act as an "observer," and measurement outcomes are not the revelation of pre-existing properties, but relational facts established through interactions (Rovelli, 1996). For example, in the classic "Wigner's Friend" thought experiment, the friend inside the lab may record a definite measurement outcome, while Wigner outside the lab still describes the entire lab as a superposition. Both accounts are valid—each relative to the system in question.

No global wavefunction. Unlike Everett's Many-Worlds interpretation, RQM does not posit a universal wavefunction that evolves deterministically. Instead, the wavefunction serves as a predictive tool for future interactions. Reality, in this view, is a web of discrete relational events. Between interactions, the wavefunction has no ontological status; it merely encodes probabilities for how systems will correlate when they meet (Rovelli, 1996, 2021)

Consistency between perspectives. A central question in RQM is whether different observers' accounts of the same event can be reconciled. Suppose Alice measures the spin of an electron and obtains "up." For Alice, this outcome becomes a fact relative to her interaction. For Bob, who has not yet interacted with Alice or the electron, that fact does not yet exist. When Bob eventually interacts with Alice, quantum mechanics ensures that their accounts will align. No hidden variables or parallel worlds are required; the relational structure of quantum mechanics guarantees compatible outcomes (Rovelli, 1996). A useful analogy is a distributed computing system: individual nodes may temporarily have different local states, but when synchronization occurs, their logs align to produce a coherent global history. Similarly, in RQM, each observer maintains a local relational account, while interactions act as "synchronization," bringing perspectives into agreement.

3.2.2 Critique and Philosophical Implications

RQM offers a distinctive approach to quantum theory by treating measurement outcomes—or "facts"—as relative to the interacting systems, rather than absolute. This relational perspective is particularly appealing because it naturally avoids certain paradoxes that arise in conventional, observer-independent interpretations. A notable example is the Frauchiger–Renner theorem (Frauchiger & Renner, 2018), which demonstrates that single-world interpretations assuming absolute measurement outcomes can yield contradictions when multiple observers reason about each other's measurements. By adopting relational facts, RQM provides a framework in which such contradictions are formally avoided, highlighting its conceptual elegance.

Despite this strength, RQM faces important challenges, particularly concerning its internal consistency and compatibility with standard quantum mechanics. Lawrence et al. (2023) argue that RQM's concept of relative facts leads to contradictions when applied to sequential measurements on entangled systems. They constructed a Wigner's–Friend-type scenario and demonstrated that if an interpretation of quantum theory introduces a conceptualization of measurement outcomes, then the probabilities of these outcomes must adhere to the Born rule

(Born, 1926). Their analysis suggests that RQM, as currently formulated, is incompatible with quantum mechanics.

In response, Cavalcanti et al. (2023) contend that the apparent contradictions identified by Lawrence et al. arise from a misunderstanding of how relational facts should be applied. They argue that when properly interpreted, RQM remains consistent with quantum predictions.

Despite this rebuttal Lawrence et al. (2025) have reaffirmed their position, asserting that the criticisms raised by Rovelli et al. do not adequately address the fundamental issues with RQM. They maintain that RQM's framework leads to inconsistencies when subjected to rigorous analysis and should not be considered a valid interpretation of quantum mechanics.

This ongoing debate underscores the complexities and challenges in reconciling RQM with the established principles of quantum mechanics. While RQM offers an intriguing perspective by emphasizing the relational nature of quantum states, its internal consistency and compatibility with standard quantum theory remain contentious issues that require further scrutiny and clarification.

While the debate over RQM’s internal consistency highlights ongoing technical challenges, the interpretation also carries significant philosophical implications. RQM fundamentally challenges classical notions of realism. If facts are relational, absolute properties—such as “the spin is up” or “the apple is red”—do not exist independently of observers. Objectivity emerges not from detached truths but from the alignment of perspectives through interaction. This “relational turn” shifts the focus of physics from intrinsic entities to a network of correlations, emphasizing how reality is constituted by interactions rather than pre-existing properties (Rovelli, 1996, 2021).

3.3 Formalizing Relationality in Modern Mathematics

Just as RQM emphasizes that the properties of a system exist only relative to interactions, modern mathematics provides frameworks that formalize this relational perspective. Instead of treating objects as isolated entities with intrinsic properties, these approaches focus on the connections, interactions, and processes that define them.

3.3.1 Category Theory

Category theory offers a language for describing systems in terms of objects and the relationships (morphisms) between them (Mac Lane, 1978). In this framework, what matters is not the internal essence of an object but how it interacts with everything else. A famous result, the Yoneda lemma, illustrates this principle: an object can be fully understood by the collection of its relationships to all other objects in the category (Leinster, 2014; Mac Lane, 1978). One way to picture this is to think of a person in a social network—their identity is not described by some hidden essence, but by their connections and interactions with others.

Category theory already plays a role in computer science, especially in functional programming, where monads and functors provide ways of organizing computations relationally rather than procedurally (Wadler, 1995). This connection makes it a natural bridge between abstract mathematics and computational practice.

3.3.2 Homotopy Type Theory (HoTT)

Modern mathematics is usually built on Zermelo–Fraenkel set theory with the Axiom of Choice (ZFC). In this framework, every object is ultimately a set, and identity is absolute: two sets are either the same or not. Membership is also binary—an element either belongs to a set, or it does not (Jech, 2003). HoTT takes a different approach by rethinking what it means for two things to be "the same." Instead of reducing everything to sets, HoTT treats objects as types, and equality is described in terms of paths between them (Awodey, 2010; The Univalent Foundations Program, 2013).

A good way to picture this is with shapes. In set theory, two triangles are only equal if they are literally the exact same triangle. In HoTT, however, two triangles can be considered "the same" if there is a continuous transformation (a path) that turns one into the other—for instance, stretching or rotating it. There might even be several different transformations that achieve this, meaning there are multiple "proofs" of equality. Equality is no longer a simple yes/no property, but a structure in itself: a whole space of possible equivalences (Awodey, 2010).

Some mathematicians have suggested that HoTT could eventually provide an alternative to ZFC as the foundation of mathematics (The Univalent Foundations Program, 2013). Even if this never fully happens, HoTT is important because it shows that mathematics can be built on a foundation where relations, transformations, and structures are primary, rather than static membership in sets. This makes HoTT resonate strongly with relational physics, such as RQM: in both, objects do not have meaning in isolation, but only in terms of the relations and transformations they participate in.

3.3.3 Categorical Quantum Mechanics (CQM)

CQM takes the relational shift of category theory and applies it directly to quantum theory. Rather than describing quantum systems in terms of isolated states evolving in Hilbert space, CQM models them as processes and transformations within a category (Abramsky & Coecke, 2004; Coecke & Kissinger, 2017). In this framework, the emphasis is not on what a system "is" in itself, but on how it interacts with other systems.

One of CQM's distinctive features is its use of diagrammatic reasoning. Complex quantum protocols, such as teleportation or entanglement swapping, can be represented as simple diagrams of processes linked together, where the flow of information is visually transparent (Coecke & Kissinger, 2017). This makes the relational structure of quantum phenomena easier to grasp than when expressed purely in linear algebra.

Entanglement, for instance, is not seen in CQM as a mysterious "spooky action at a distance," but as a structural property of how processes compose in the category. The strong correlations that emerge between entangled systems are natural consequences of the relational framework, rather than puzzles that demand hidden variables or parallel universes (Abramsky, 2012)

3.3.4 Conclusion

The frameworks discussed—category theory, homotopy type theory, and categorical quantum mechanics—illustrate that relational thinking can be formalized rigorously in modern mathematics and physics. They shift the focus from objects as isolated entities to the interactions, transformations, and structural relationships that define them. These mathematical frameworks, while rigorous and elegant, are generally considered challenging to grasp, particularly for those without a strong background in abstract mathematics or category theory (Coecke & Kissinger, 2017).

This relational perspective resonates strongly with RQM (Rovelli, 1996), where the properties of a system only exist relative to other systems. In both mathematics and physics, meaning emerges not from intrinsic essence but from participation in a network of relations. By formalizing these ideas, these mathematical frameworks provide tools for expressing concepts that bridge philosophical reflection, computational theory, and the relational structure of physical reality.

4 The Mystery of Consciousness

Consciousness is one of the most profound and enigmatic phenomena in both science and philosophy. Broadly, it refers to the capacity for subjective experience—the awareness of sensations, emotions, thoughts, and perceptions that constitute our lived reality. Philosophers often describe these subjective qualities as qualia, the 'what it is like' aspect of experience, such as the redness of an apple or the pain of a headache (Chalmers, 1996).

While definitions vary, consciousness can be conceptually distinguished along several dimensions:

Phenomenal consciousness: the qualitative, subjective experience itself—the realm of qualia (Block, 1995).

Access consciousness: the availability of information for reasoning, guiding behaviour, and verbal report (Block, 1995).

Self-consciousness: the ability to reflect upon oneself as an individual, aware of one's own thoughts and existence (Rosenthal, 1997).

This framework highlights that consciousness is not merely the processing of information but involves the rich, qualitative, and self-referential nature of experience. In the following sections, we move beyond definitions to examine competing approaches to explaining consciousness.

We consider materialism, with its attempt to reduce mind to matter (Papineau, 2002), and idealism, which inverts this relation by making consciousness primary (Dunham et al., 2010). Both positions face deep conceptual and empirical challenges, motivating a closer look at alternative theories of consciousness. Finally, the chapter turns to accounts of so-called 'paranormal' and psi phenomena, which, though controversial, raise questions that cannot be easily reconciled within a strictly materialist framework. Together, these explorations aim to illuminate why consciousness remains such a profound mystery at the heart of philosophy and science.

4.1 Materialism: The Dominant Paradigm

Materialism, often used interchangeably with physicalism, asserts that the physical world is all that exists. From this viewpoint, reality consists entirely of matter, energy, and the laws of physics (Papineau, 2002). Mental states are fully reducible to physical brain states, and consciousness is often described as an emergent property of neural complexity (Kim, 1998).

Modern science, particularly since the Enlightenment, has embraced this framework due to its empirical successes. From Newtonian mechanics to molecular biology, physicalism has provided predictive models and technological advances (Papineau, 2002). In neuroscience, this has culminated in the belief that understanding the brain's circuitry will eventually explain the mind (Dennett, 1991; Papineau, 2002).

Key assumptions of materialism include:

The universe is composed entirely of matter and energy. Materialism holds that everything in existence, from the largest galaxies to subatomic particles, is ultimately made of physical substance. Nothing exists beyond the material domain, and all phenomena—including consciousness—must ultimately be explained in these terms (Papineau, 2002).

Causality flows from the bottom-up. Materialist thinking assumes that causal influence starts at the micro-level (e.g., particles, molecules, neurons) and builds upward to generate complex macro phenomena. This bottom-up perspective emphasizes that higher-level structures emerge from fundamental physical interactions (Kim, 1998).

Consciousness arises from physical interactions. Mental states, including perceptions, thoughts, and feelings, are understood as emergent properties of neuronal activity and the complex interactions of matter in the brain. Consciousness is therefore not an independent entity but a product of physical processes (Kim, 1998).

The last assumption underlies computationalism, which sees the brain as a type of computer, and functionalism, which defines mental states by their causal roles rather than their substance (Putnam, 1967). Following this line of thought, some proponents argue that consciousness is substrate independent. In other words, the right computational architecture, regardless of its physical medium, could give rise to conscious experience (Chalmers, 1996). This assumption underpins ongoing research into artificial consciousness, where neuroscientists, computer scientists, and philosophers explore whether machines could not only mimic human behaviour but also possess subjective awareness (Butlin et al., 2023; Seth, 2025).

However, proponents of artificial consciousness face significant critiques. Searle (1980) argues that symbol manipulation alone cannot generate genuine understanding. In his famous

Chinese room thought experiment, he imagines a person following a set of syntactic rules to manipulate Chinese symbols without understanding their meaning. This illustrates that a system may appear intelligent while lacking true comprehension, highlighting conceptual limits of AI systems. Penrose (1989) goes further, suggesting that human consciousness may transcend classical algorithmic computation, potentially arising from quantum processes within the brain. Together, these critiques indicate that consciousness may not automatically emerge from computational complexity, underscoring both conceptual and, in Penrose's case, speculative empirical challenges to materialist accounts of mind.

Despite its dominance, materialism faces profound conceptual and empirical challenges, especially regarding consciousness and quantum mechanics:

The Hard Problem of Consciousness. First articulated by Chalmers (1996), the "hard problem" refers to the difficulty of explaining qualia—the subjective, first-person experiences—using objective, third-person scientific methods. Even if we fully map the neural correlates of pain, for example, we do not thereby explain what it feels like to be in pain. This explanatory gap suggests that consciousness may not be fully reducible to physical processes.

The Problem of Intentionality. Mental content is about things—it has intentionality. But matter, as described by physics, has no "aboutness." This raises the question: how can collections of physical particles give rise to thoughts about something? (Kim, 1998; Searle, 1983)

The Measurement Problem in QM. Materialism presumes an observer-independent reality. However, QM complicates this by entangling the observer with the observed. The measurement problem (e.g., the collapse of the wave function) suggests that consciousness may play a non-trivial role in determining physical outcomes (Rovelli, 2021). This challenges the idea that consciousness is merely a byproduct of matter.

4.2 Idealism: Consciousness as Fundamental

Idealism asserts that consciousness is not a by-product of matter but the ground of reality itself. Rather than viewing mind as an emergent property of brain activity, idealist perspectives suggest that matter arises within and through consciousness. By making consciousness fundamental, idealism offers a framework in which the central mysteries of experience—such as qualia and intentionality—are addressed directly, rather than being reduced to material processes (Dunham et al., 2010).

This idea has deep roots in Eastern philosophy. In classical Advaita Vedānta, articulated by Śaṅkara in the 8th century, the apparent multiplicity of the world is ultimately an illusion (*māyā*) projected upon Brahman, the one undivided consciousness (Deutsch, 1973). Similarly, early Yogācāra Buddhism (4th century) develops a "mind-only" (*cittamātra*) ontology, according to which all phenomena are manifestations of consciousness rather than independently existing material entities (Lusthaus, 2002). These traditions emphasize that consciousness is not contained within the world but is the condition for the world's appearance.

Western philosophy developed parallel ideas. Plato's Theory of Forms presented a realm of timeless, non-material patterns that ground sensible reality, suggesting that the world we perceive is shaped by underlying abstract structure (Plato, 1992, 507b-509c). Leibniz described the universe as composed of monads—centres of perception and relation—each reflecting the whole, emphasizing that the fundamental constituents of reality possess a form of consciousness (Leibniz, 1714/1989). Kant's Transcendental Idealism further argued that the mind actively structures experience: space, time, and the organization of phenomena are forms of human intuition rather than properties of things-in-themselves, highlighting the constitutive role of consciousness in shaping reality (Kant, 1781/1998). Schopenhauer, building on these insights, proposed that the underlying reality is the "will," a universal, conscious force manifesting through phenomena, framing the world itself as an expression of a foundational mental principle (Schopenhauer, 1818/1969). Together, these thinkers illustrate a tradition in Western thought that treats consciousness or mind as primary, shaping or even constituting the apparent material world.

Contemporary discussions often return to these themes in new language. Analytic Idealism, as developed by Kastrup (2019), argues that the cosmos is best understood as the unfolding of a universal consciousness, with individual minds as dissociated alters of this whole. Panpsychism, in contrast, has been defended by Goff (2019), who proposes that consciousness is a ubiquitous feature of matter, thereby avoiding the "hard problem" of explaining its sudden emergence. Hoffman (2019) frames perception as a user interface: what we see as "objects" are adaptive icons generated by consciousness for survival rather than accurate depictions of reality. Faggin (2024), approaching from the standpoint of physics, has proposed a quantum information theory of consciousness, in which the fundamental units of reality are conscious entities exchanging information.

From the preceding discussion, key assumptions of idealism include:

Consciousness is ontologically fundamental. Consciousness exists prior to any physical processes and serves as the foundation of reality. It is the source from which all experiences, perceptions, and phenomena arise, independent of material arrangements.

The material world is derivative. The physical world, including objects, events, and structures, is a manifestation within consciousness rather than an independent entity. Matter and phenomena are patterns or appearances emerging from conscious activity, not the source of awareness itself.

Mind precedes and grounds physical reality. Mind provides the framework within which reality unfolds, shaping the structures and relations we observe. Physical laws and causal patterns are expressions or constraints of this underlying consciousness, making mind the active ground for the observable world.

While idealism addresses problems in materialism, it is not without its own difficulties:

The Problem of Inter-Subjectivity. If reality is fundamentally mental, a central challenge is explaining why different minds appear to inhabit the same consistent physical world. Idealists often appeal to a universal consciousness or shared field of awareness to account for this convergence (Kastrup, 2019b). However, this gives rise to further ontological questions regarding the structure of such a universal consciousness, the autonomy and causal powers of individual minds, and the coherence of shared experiences — issues closely related to what Chalmers (1996) identifies as the “hard problem” of consciousness.

Lack of empirical anchoring. A recurring criticism in the literature is that idealism is unfalsifiable or overly speculative (Dunham et al., 2010). Even models sympathetic to consciousness-first perspectives, such as Hoffman’s interface theory of perception (Hoffman, 2019), recognize that while consciousness may offer a compelling explanatory framework, these accounts remain challenging to test and rarely provide clear empirical predictions. Bridging the gap between subjective experience and physical observation continues to be a major challenge.

The emergence of regularity. Idealists must explain why the universe exhibits stable and consistent laws. If reality is fundamentally mental, it is not immediately clear what guarantees the persistence and uniformity of physical phenomena. Appeals to a cosmic mind or an underlying mathematical order provide a potential explanation, but this merely defers the explanatory challenge: one must still account for why consciousness itself produces consistent, law-governed phenomena and why these regularities are observed uniformly by all conscious agents (Goff, 2019). Addressing this issue remains a key task for idealist frameworks attempting to reconcile the fundamental role of consciousness with the apparent stability of the physical world.

4.3 Paranormal Experiences as Challenges to Materialism

Despite the dominance of materialist frameworks, a range of anomalous conscious phenomena persist across cultures and historical periods. While often marginalized in mainstream science, these experiences—ranging from near-death experiences (NDEs) to telepathy and mystical states—raise important questions about the nature and limits of brain-based consciousness. From a scientific perspective, these phenomena pose significant challenges: they are often anecdotal, difficult to replicate under controlled conditions, and susceptible to cognitive biases and cultural interpretation (Alcock, 2003). As a result, their investigation is controversial, and their evidential weight in debates about consciousness is debated.

At the same time, it is worth noting that scientific validation is not necessarily the only measure of legitimacy; such experiences may hold significance for understanding consciousness even if they cannot be fully captured or explained by current empirical methods. Indeed, science — powerful as it is — has inherent limitations. Just as Gödel's incompleteness theorems (Gödel, 1931) demonstrate that formal systems contain truths that cannot be proven within the system itself, there may be aspects of consciousness and reality that elude empirical proof yet remain meaningful and knowable in other ways. Some truths are accessible not through measurement or replication, but through subjective experience, intuition, and reflection — the things we come to "know in our hearts." This is a stance I will expand in chapter 6.

This section presents a condensed overview of selected phenomena, highlighting both empirical reports and the theoretical implications they raise.

4.3.1 Near-Death (NDE) and Out-of-Body (OBE) Experiences

Near-death experiences (NDEs) typically occur during extreme physiological stress, such as cardiac arrest, and are characterized by phenomena including out-of-body perceptions, tunnel experiences, life reviews, and encounters with luminous or spiritual entities (Greyson, 1983; Lommel et al., 2001; Moody, 1975). Neurobiological explanations—such as hypoxia, endorphin release, or cortical disinhibition—have been proposed (Blackmore, 1992), though the consistency and vividness of many reports raise questions about whether purely materialist accounts can fully explain these experiences.

Out-of-body experiences (OBEs), defined as the sensation of observing one's body from an external perspective, also occur independently of life-threatening situations and can be experimentally induced through brain stimulation or immersive virtual reality setups (Blanke et al., 2002). While partial neurological mapping, particularly of the temporoparietal junction, has identified correlates of these experiences (Blanke et al., 2002), many subjective reports suggest awareness that extends beyond ordinary sensory access (Greyson, 1983; Lommel et al., 2001), indicating that consciousness may not be fully reducible to cortical activity.

4.3.2 Anomalous Cognition

Anomalous cognition is the apparent ability to access information beyond ordinary sensory channels; a phenomenon explored through both experimental research and clinical observation (Tressoldi & Storm, 2021). In this section, we examine some of the notable work on the topic:

J. B. Rhine's foundational studies in ESP. In the early twentieth century, psychologist J. B. Rhine at Duke University pioneered systematic experiments on extrasensory perception (ESP), establishing the foundation for modern parapsychology. His goal was to apply quantitative, repeatable methods to the study of information transfer beyond known sensory channels (Rhine, 1934).

Rhine introduced the standardized Zener card test—a deck of twenty-five cards with five distinct symbols—to measure subjects' guessing accuracy under controlled conditions. Statistical analysis allowed the calculation of exact probabilities for performance under random chance, lending experimental rigor to what had previously been anecdotal claims (Rhine, 1934; Rhine & Pratt, 1957)

A notable example is the Pearce–Pratt distance series, in which participant Hubert E. Pearce attempted to identify target cards selected by experimenter J. G. Pratt from a separate building. Across thirty-seven sessions, Pearce achieved results significantly above chance (Rhine & Pratt, 1957). However, later replications yielded inconsistent outcomes, and critics such as Hansel (1966) pointed to potential methodological weaknesses, including inadequate isolation and lack of double-blind controls.

Despite these criticisms, Rhine's studies established methodological and statistical standards that transformed parapsychology into a quantitative research tradition. His work remains historically significant as the first sustained attempt to explore non-local aspects of cognition through controlled experimentation.

Carl G. Jung and synchronicity. In collaboration with physicist Wolfgang Pauli, Jung (1952/2011) introduced the concept of synchronicity to describe acausal yet meaningfully connected events—coincidences that do not follow conventional causal chains but appear to reflect an underlying coordination between mind and external events. Pauli contributed a complementary perspective, suggesting that such phenomena might point to a deeper, psychophysically unified substrate of reality in which mind and matter are not fundamentally separate.

One of Jung's most famous examples involves a patient undergoing therapy for emotional distress. While recounting a dream about a golden scarab beetle, a real beetle of almost identical appearance tapped against the window. Jung interpreted this event not as mere chance, but as a meaningful coincidence, where the dream content and external reality resonated in an acausal, psychologically significant way (Jung, 1952/2011). Carroll (2003) suggests that experiences of synchronicity can be more plausibly understood as instances of apophenia—the human tendency to perceive meaningful patterns in random events. He notes that over a lifetime, people are likely to encounter multiple unexpected coincidences, making it unnecessary to invoke Jung's metaphysical interpretation.

The biologist Rupert Sheldrake extended the study of anomalous cognition into the biological domain through his hypothesis of Morphic Resonance, which posits that natural systems inherit a kind of collective memory from prior similar systems (Sheldrake, 1981, 2009). According to this model, telepathy and other non-local connections may arise from shared morphic fields that transcend space and time.

One of Sheldrake's most widely cited programs investigated telephone telepathy. In controlled trials, participants attempted to identify, before answering the phone, which of several possible callers was attempting to contact them. Across 571 trials, participants correctly identified callers at rates significantly above chance (Sheldrake & Smart, 2003). Similar experiments using email demonstrated statistically significant anticipatory correlations in physiological and emotional responses (Sheldrake & Smart, 2005). These findings suggest that close personal bonds, particularly familial or emotional ones, may facilitate non-local information transfer.

Sheldrake also examined non-human subjects. In his studies on dogs and cats, pets frequently anticipated the arrival of their owners at irregular times, appearing at windows or doors shortly before arrival without any detectable sensory cues (Sheldrake, 2011). Additionally, he investigated the "sense of being stared at" in humans, where participants were asked to detect when someone was looking at them without sensory cues. Through multiple trials, participants performed above chance, suggesting a form of non-local perception (Sheldrake, 2003)

Although these results remain controversial and are not widely accepted within mainstream biology (Gomez-Marin, 2021), they provide experimental evidence that some mental or behavioural phenomena may involve non-local cognitive connections. Collectively, Sheldrake's work broadens the scope of anomalous cognition beyond humans, indicating that non-local information transfer might be a pervasive feature of life.

Diane Hennacy Powell, a psychiatrist and neuroscientist, has written extensively on the scientific basis for psychic and extrasensory perception. in Powell (2009) she surveys experimental and clinical evidence which she interprets as supporting the existence of nonlocal aspects of consciousness. Drawing on findings from parapsychology, neuroscience, and physics, Powell argues that consciousness may not be confined to the brain but instead functions as a field-like phenomenon capable of information exchange beyond conventional sensory channels.

In Powell (2015) she presents a case study of apparent nonverbal information transfer between an autistic child and a facilitator under conditions intended to control for conventional cueing. She reports that the child was able to spell or select correct answers to questions that the child could not ostensibly perceive and treats these observations as preliminary support for the hypothesis that some individuals—especially those with atypical neural development—may access nonlocal or shared informational processes consistent with her theoretical framework.

In recent years, Powell's work has gained wider public attention through *The Telepathy Tapes*, a popular podcast hosted by Dickens (2024) that centres on cases involving nonverbal autistic individuals purported to demonstrate telepathic communication. The podcast features Powell as a primary expert and presents filmed "telepathy tests," narratives from families, and experiments in which nonverbal children respond accurately to stimuli that were not visible to them. However, the podcast has been subject to significant criticism from sceptical voices. Critics argue that it overlooks possible methodological problems, such as unintentional cues from facilitators, ignores sceptical perspectives, and presents extraordinary claims without sufficient scientific caution. (Vyse, 2025; Walker, 2025).

4.3.3 Transplants and Surgical OBEs

Clinical reports document striking cases in which heart transplant recipients experience significant changes in personality, preferences, and even memories after receiving a donor organ. Pearsall (1999) compiled numerous testimonies from recipients. Notable cases include a young girl who received the heart of a murdered child and began experiencing vivid dreams and emotional responses that helped solve the crime. Other recipients reported changes in tastes, hobbies, and behaviours, later confirmed to align with the donor's lifestyle. Pearsall (1999) further observers that some transplant recipients report acquiring memories, emotions, or personality traits that appear to originate from their donors, despite having no ordinary means of access to such information.

Perhaps the most widely discussed example of consciousness apparently occurring independently of measurable brain activity is the case of Pam Reynolds. During a rare surgical procedure to repair a basilar artery aneurysm, Reynolds underwent hypothermic cardiac arrest: her body temperature was lowered to approximately 15.5°C, her heartbeat and EEG activity ceased, and her brain was drained of blood. Clinically, she was considered dead (Sabom, 1998).

Despite these conditions, Reynolds later reported a vivid OBE, describing surgical instruments and conversations she could not have perceived through normal sensory channels. Sabom (1998) considers this case one of the most compelling examples of veridical perception during a period of flat EEG.

While Pearsall (1999) compiled numerous testimonies from recipients, and Reynolds' detailed account (Sabom, 1998) suggests the possibility of non-local or distributed aspects of consciousness, these findings remain highly controversial. Sceptical analyses (Fagan, 2025; Woerlee, 2005) emphasize the need to consider psychological, physiological, and situational factors—including stress, medication effects, anaesthesia awareness, and the reconstructive nature of memory—before drawing conclusions about non-neural or non-local cognitive processes.

4.3.4 Mystical, Unitive, and Light Experiences

Mystical or unitive experiences—marked by ego dissolution, a sense of timelessness, and feelings of cosmic unity—have been reported across a wide variety of contexts. In meditative and contemplative traditions, practitioners frequently describe experiences of merging with a larger reality or "losing" the self, sometimes accompanied by profound emotional or ethical insights. Religious mystics throughout history have documented similar states, often interpreting them as encounters with the divine or ultimate reality (James, 1902). More recently, controlled studies of psychedelics, such as psilocybin and LSD, have reliably induced experiences with comparable phenomenological qualities, including intense unity, transcendence of time and space, and ineffable insight (Carhart-Harris et al., 2014; R. R. Griffiths et al., 2006). These converging reports suggest that, despite differences in culture, method, or pharmacology, there may be common neural and psychological mechanisms underlying mystical states, pointing to a potentially universal aspect of human consciousness.

Throughout religious and contemplative traditions, hagiographies and spiritual narratives have often depicted saints, monks, and yogis as emitting light, experiencing visions of cosmic unity, or displaying behaviours interpreted as signs of deep altered consciousness. (James, 1902). While such accounts are usually symbolic or metaphorical, they reflect enduring attempts to describe ineffable states using culturally resonant imagery. In a contemporary example, Federico Faggin recounts a meditative episode in which he perceived a luminous pillar emerging from his chest, accompanied by feelings of boundless awareness and unity (Faggin, 2021, 2024). These experiences are highly vivid and often transformative, though inherently subjective.

Modern science has explored whether extraordinary subjective experiences might have measurable biophysical correlates. Research on ultra-weak photon emission, or biophotons, has demonstrated that living cells emit extremely faint light, possibly related to metabolic or oxidative processes (Popp et al., 1992). In a controlled experiment, Van Wijk et al. (2005) found that meditation modulated the statistical coherence of photon emission from the hands and forehead, suggesting that mental states may influence physiological light dynamics. However, independent replications are limited, and some studies suggest that fluctuations in biophotons may result from subtle physiological factors such as heat shock, reactive oxygen species, anatomical location, and metabolic rate (Kobayashi et al., 2014; R. Van Wijk et al., 2006) rather than direct effects of consciousness. Consequently, while intriguing, these findings do not establish a causal link between consciousness and photon emission, and the mechanisms underlying such associations remain speculative.

4.3.5 Defensive Commentary

This section offers my personal interpretation and defence of the phenomena discussed in this chapter. Over the past several years, I have followed discussions on paranormal and anomalous experiences, approaching them initially from a sceptical perspective. It is undeniable that much of the literature in this area faces critique from the scientific community: some studies are dismissed as pseudoscience, and others are criticized as methodologically flawed or even misleading. Such responses, while important, do not exhaust the potential significance of these phenomena for understanding consciousness.

I argue that a more open-minded approach is warranted. There appears to be a reluctance, both within science and the broader public, to entertain the possibility that unusual or anomalous experiences could be meaningfully integrated into a coherent conceptual framework. In Chapter 6, I propose such a framework, one that seeks to reconcile rigorous inquiry with intuitive understanding, creating space for these experiences without dismissing them outright.

A major problem in studying these experiences is that we try to make logical sense of what may, by its very essence, not belong to the realm of logic at all. They concern the felt, experiential side of consciousness, and intuitively, we cannot dissect our feelings with logic—we can only engage with and trust them. This, I believe, is a core reason why reproducibility is often inconsistent: sometimes our intuitive sense is clear and confident, and other times it is weaker or obscured by doubt. Moreover, consciously thinking about an experiment or worrying about whether it "makes sense" can interfere with our intuitive engagement, diminishing our ability to perceive or respond. In essence, the very act of overthinking can disrupt the subtle faculties that these phenomena appear to rely upon.

5 Idealism and Quantum Consciousness

This chapter examines the view that consciousness is not a secondary byproduct of matter but the foundation of reality itself. We begin with classical foundations in Plato's Theory of Forms and Leibniz's Monadology, then turn to modern reinterpretations of idealism by Donald Hoffman, Bernardo Kastrup, and Philip Goff. The discussion then shifts to quantum-inspired perspectives, including David Bohm's Implicate Order, Penrose and Hameroff's Orch-OR theory, and Federico Faggin's vision of consciousness as irreducible and fundamental. Together, these approaches highlight the enduring appeal of idealist thought and its resonance with contemporary philosophy and physics.

5.1 Classical and Historical Foundations of Idealism

The idea that consciousness is fundamental to reality has roots in classical and early modern philosophy. Plato argued that the material world reflects deeper, timeless Forms—abstract structures shaping the phenomena we experience (Plato, 1992, 507b-509c). Leibniz developed a distinct metaphysical framework in which reality consists of indivisible, self-contained centres of perception called monads, each reflecting the universe from its own perspective (Leibniz, 1714/1989; Wilson, 1989). While differing in structure, both philosophies emphasize that reality is ultimately shaped by non-material patterns or centres of perception, providing a foundation for understanding consciousness as a fundamental feature of the world—a theme that resonates with contemporary idealist thought and modern interpretations of quantum mechanics.

5.1.1 Plato's Allegory of the Cave and the Theory of Forms

Plato (427–347 BCE) is one of the foundational figures in Western philosophy, and his ideas continue to shape discussions about reality, knowledge, and consciousness. Two of his most influential contributions—the Allegory of the Cave and the Theory of Forms—offer a metaphysical framework that resonates strongly with later philosophical debates on the nature of perception, illusion, and ultimate reality.

The Allegory of the Cave. In the Republic (Plato, 1992, 514a-517a) Plato presents the allegory of prisoners chained in a cave, facing a wall on which shadows are projected by objects passing before a fire. For the prisoners, the shadows constitute the whole of reality; they are unaware of the objects or the fire that generate them. If one prisoner is freed and sees the world outside the cave, he initially resists the unfamiliar reality but eventually realizes that the shadows were mere appearances of a deeper truth. Upon returning to the cave to share his discovery, however, he is met with hostility and disbelief.

This allegory illustrates Plato's epistemological distinction between appearance and reality. The prisoners perceive only shadows, mistaking them for the whole of reality, while true knowledge requires the soul to turn away from the world of appearances toward the intelligible realm. Philosophical reasoning allows the freed individual to apprehend the higher realities, though communicating this insight to those still chained proves extremely difficult and often met with disbelief (Plato, 1992, 518c-520a).

The Theory of Forms. Underlying the allegory is Plato's metaphysical doctrine of the Forms. According to Plato, the physical world is in constant flux and thus incapable of yielding absolute knowledge. True knowledge (*epistēmē*) concerns eternal, unchanging realities—the Forms—which exist in a non-empirical, intelligible realm. Examples include Justice, Beauty, and Equality, which are not merely abstract concepts but perfect, objective realities of which empirical instances are imperfect copies or participations (Plato, 1992, 507b-509c).

In this framework, the physical world is derivative, a realm of appearances that imperfectly mirrors the intelligible order of the Forms. While Plato's contributions to philosophy are foundational, his theories have faced notable criticisms. The Theory of Forms is challenged by Aristotle's Third Man Argument, which questions how a Form can account for the properties of its instances without leading to an infinite regress (Aristotle, 1933, 987b-990a). In addition, the Allegory of the Cave suggests an elitist stance, as it implies that only a few individuals—the philosophers—can apprehend truth, while the majority remain confined to illusion. Despite these limitations, Plato's distinction between appearance and reality and his emphasis on intellectual ascent continue to provide a lasting framework for discussions of perception, knowledge, and consciousness.

5.1.2 Leibniz's Theory of Monads

Gottfried Wilhelm Leibniz (1646–1716), one of the central figures of rationalist philosophy, developed a metaphysical system centred on *monads*—simple, immaterial, indivisible substances that constitute reality. In the Monadology (Leibniz, 1714/1989), he describes monads as "metaphysical points" that contain no spatial extension but serve as centres of perception and activity, each expressing the entire cosmos from its unique point of view.

Monads are entelechies, self-contained sources of force and change. Each is characterized by perception (the representation of multiplicity within unity) and appetition (the internal drive toward new states). Their clarity of perception determines their place in the metaphysical hierarchy: from bare monads with dim awareness, through animal souls with memory, to rational spirits capable of apperception—the reflective awareness of one's own perceptions. This distinction between perception and apperception anticipates later debates about unconscious processing and conscious reflection in philosophy and cognitive science (McRae, 1976).

Although monads never interact causally, their states unfold in perfect correspondence through a pre-established harmony instituted by God. Thus, the appearance of physical causation is the coordinated harmony of self-contained mental substances (Leibniz, 1714/1989). In this sense, consciousness is not an emergent product of matter but a fundamental aspect of reality itself.

Leibniz's vision resonates with later forms of panpsychism and idealism, where reality is conceived as constituted by centres of subjective perspective. Contemporary theorists such as Faggin (2024), Skrbina (2007), and others have noted parallels between monadology and modern attempts to view physical reality as the appearance of deeper informational or mental structures. Although Leibniz's system has been criticized for its theological dependence and metaphysical isolation (Kant, 1781/1998; Russell, 1900), it remains significant for contemporary discussions of consciousness as an irreducible, non-emergent feature of being.

5.2 Contemporary Philosophical Idealism

Building on the historical foundations of idealism, modern thinkers have developed theories that reinterpret classical ideas considering contemporary philosophy, cognitive science, and perceptual psychology. Donald Hoffman, for example, proposes the Interface Theory of Perception, suggesting that our sensory experiences do not reveal reality as it is but instead provide a user-interface shaped by evolutionary pressures (Hoffman et al., 2015). Reality, in this view, is fundamentally relational and informational rather than material. Similarly, Bernardo Kastrup's Analytic Idealism argues that all experiences emerge from a single, universal consciousness, with individual minds representing localized perspectives within this overarching mental field (Kastrup, 2019a). Philip Goff's panpsychist framework complements these perspectives by positing that consciousness is a fundamental and ubiquitous feature of reality, with physical phenomena emerging from the intrinsic experiential properties of the simplest constituents of matter (Goff, 2017, 2019). Collectively, these contemporary approaches extend classical idealist insights, emphasizing the primacy of consciousness, relationality, and information as the foundation of experience—ideas that resonate with quantum-inspired frameworks explored later in this thesis.

5.2.1 Donald Hoffman's Interface Theory and Conscious Realism

Donald D. Hoffman, a professor of cognitive sciences at the University of California, Irvine, has developed a controversial but increasingly influential theory of consciousness based on evolutionary arguments and mathematical formalism. His framework combines the Interface Theory of Perception (ITP) with a broader metaphysical stance he calls Conscious Realism, both of which challenge the standard materialist view of perception and reality.

Interface Theory of Perception. Hoffman and collaborators use evolutionary game theory and computational modelling to argue that natural selection favours fitness rather than truth. Organisms that perceive reality accurately would not necessarily survive as well as those that perceive simplified, survival-relevant cues. Consequently, perception functions like a user interface—a set of adaptive symbols representing aspects of the world that are useful for survival, rather than a transparent window onto objective reality (Hoffman et al., 2015). In this sense, ITP is primarily epistemological: it suggests that our sensory access does not provide veridical knowledge of the world, directly challenging the materialist assumption that perception mirrors observer-independent reality.

Conscious Realism. Hoffman's early work on conscious agents laid the conceptual foundation for Conscious Realism, which moves from epistemology to ontology. In this framework, the fundamental constituents of reality are not spacetime or matter but conscious agents, with physical reality emerging from the structured interactions among them (Hoffman, 2008). He formalizes these agents mathematically using Markovian kernels (probabilistic transformations) and the compositional structures of category theory, allowing the dynamics of interacting agents to be analysed systematically (Fields et al., 2017).

Hoffman envisions a predictive framework analogous to the standard model in physics but grounded in consciousness rather than particles. Early work explores how interacting networks of conscious agents could give rise to the structure of spacetime and aspects of quantum field theory. He has speculated that certain geometric structures in quantum field theory, such as the amplituhedron—which encodes particle scattering amplitudes—might emerge naturally from the dynamics of conscious agents (Hoffman, 2019).

In emphasizing formalization and testable modelling, Hoffman argues that idealism must move beyond metaphysical speculation to achieve the rigor expected of scientific theory. (Fields et al., 2017; Hoffman, 2019). While the framework is still speculative, it represents one of the most detailed attempts to bridge philosophical idealism with mathematical and potentially empirical investigation. Critics, however, caution that the framework remains largely hypothetical and that the strong ontological assumptions may limit its integration with established physical and neuroscientific models (Allan, 2022). Allan further notes that the Fitness Beats Truth theorem, which underpins the ITP, risks oversimplifying evolutionary processes and may be self-refuting, since it relies on our perceptions to demonstrate that perceptions are unreliable. Moreover, the mathematical formalism, while rigorous, currently offers limited guidance for empirical testing or practical applications, leaving key aspects of the theory speculative.

As a personal reflection, Hoffman and his team's work stands at the bleeding edge between philosophy and science. As mentioned in Chapter 4.2 and further discussed in this Chapter 5, proponents of idealism argue that materialism cannot adequately explain consciousness. That may well be true—and I, along with others such as Faggin (2024), hold that consciousness is indeed irreducible. However, if idealism is to be more than a metaphysical stance, it must also demonstrate how foundational physical theories such as general relativity and quantum mechanics—landmarks of materialist science—can be derived from consciousness itself. This is precisely the challenge that Hoffman and his collaborators are attempting to address. I return to this topic in Chapter 6.

5.2.2 Bernardo Kastrup's Analytic Idealism

Bernardo Kastrup's Analytic Idealism is a contemporary, rigorously formulated form of metaphysical idealism that positions consciousness as the sole ontological primitive. Rejecting both physicalism—which holds that matter is fundamental—and dualism—which treats mind and matter as separate substances—Kastrup argues that the entire physical world is a representation of mental processes occurring within a single, universal consciousness (Kastrup, 2019a).

A central claim of analytic idealism is that what we experience as distinct, external objects and individual subjects are, in fact, dissociated segments—or “alters”—of the universal mind. While the framework is metaphysically monist, asserting that there is only one underlying substance, it is phenomenologically pluralist: we perceive multiple conscious perspectives, even though all arise from the same underlying reality (Kastrup, 2019a). This model allows Kastrup to explain the appearance of individuality without postulating multiple ontologically distinct minds.

Kastrup supports his theory through several lines of reasoning. Ontologically, positing consciousness as fundamental avoids the dualistic split between mind and matter. Explanatorily, the model accounts for otherwise puzzling phenomena, including the unity of consciousness, the structure of dreams, psychedelic experiences, and the apparent indeterminacy in quantum measurement. Methodologically, Kastrup grounds his arguments in analytic philosophy, Bayesian reasoning, and analogies with information theory, ensuring that his idealism remains logically coherent and subject to rigorous critique. (Kastrup, 2019a, 2019b).

Kastrup frames Analytic Idealism as a scientifically serious alternative to materialism rather than a purely spiritual or mystical doctrine. Kastrup supports his theory through several lines of reasoning. Ontologically, he posits universal phenomenal consciousness as the only fundamental reality, rejecting dualism and physicalism. Explanatorily, he draws on phenomena such as dissociation (notably DID), transpersonal experience, and psi-anomalies to illustrate how individuality arises within a universal mind. Methodologically, he constructs his arguments using the tools of analytic philosophy and phenomenology, treating anomalous data as philosophically relevant rather than dismissible (Kastrup, 2021).

Critics note that while Kastrup’s Analytic Idealism is philosophically rigorous, several assumptions remain debatable. These include the sharp separation between perception and reality, the identification of subjective individuation with the cell, and the claim that phenomena not physically describable are necessarily nonphysical. Further empirical research, particularly linking mystical or psychedelic experiences with brain activity, could help substantiate and refine the framework (Sjöstedt-Hughes, 2025). From my perspective, the theory presents an elegant framework, though its high level of abstraction may limit intuitive accessibility. In Chapter 6, I attempt to explore these ideas in a more intuitive way, complementing the formal argumentation presented here.

5.2.3 Philip Goff and Panpsychist Idealism

Philip Goff, a contemporary philosopher of mind, advocates a form of panpsychist idealism in which consciousness is a fundamental and ubiquitous feature of reality. Departing from materialist assumptions, Goff argues that the mind cannot be fully explained as a byproduct of physical processes; instead, consciousness is ontologically primary. In his framework, the physical world—including space, time, and matter—emerges from the fundamental qualities of conscious experience (Goff, 2017).

A key motivation for Goff's view is the Hard Problem of Consciousness, which highlights the explanatory gap between objective accounts of brain processes and subjective experience. According to Goff, materialist accounts fail because they treat consciousness as emergent from matter rather than acknowledging it as a foundational property. Panpsychism provides a solution by postulating that even the simplest constituents of reality possess experiential qualities, which combine in complex systems to produce human consciousness (Goff, 2019).

Goff situates his work within a broader philosophical tradition, drawing on both analytic philosophy and historical idealist thought. While not strictly monist in the classical sense, his panpsychism aligns with idealist intuitions: the world is intelligible through conscious experience, and reality is, at its core, mental in nature. This perspective opens a conceptual bridge to quantum-inspired theories of consciousness, suggesting that the deep structures of physics and the structures of mind may be intertwined (Goff, 2017, 2019)

In summary, Goff provides a rigorous philosophical account of consciousness as fundamental, offering an idealist alternative to physicalism while remaining connected to contemporary scientific and philosophical discourse. A frequently raised objection to Goff's panpsychism concerns the attribution of consciousness to elementary particles. Critics argue that this idea is conceptually implausible, empirically unverifiable, and difficult to meaningfully represent (Matthew, 2024). I suggest, however, that Goff's proposal that elementary particles possess a form of consciousness is on the right track; they reflect attributes of consciousness and, for example, can act as observers. This perspective will be developed in more detail in Chapter 6.

5.3 Quantum Consciousness Theories

Quantum approaches to consciousness explore the possibility that fundamental aspects of mind are closely linked to the structures and dynamics of physical reality. David Bohm's

Implicate Order offers a holistic framework in which both matter and consciousness emerge from a deeper, enfolded reality, with apparent separateness arising from underlying interconnected structures (Bohm, 1980). Penrose and Hameroff's Orchestrated Objective Reduction (Orch OR) theory proposes that quantum processes in neuronal microtubules contribute to conscious experience, linking neurobiology with objective reductions in spacetime geometry (S. Hameroff & Penrose, 2014a; Penrose, 1989). Similarly, Federico Faggin and Giacomo Mauro D'Ariano's quantum consciousness theory posits that consciousness itself is a fundamental ontological entity, with quantum information as the medium through which subjective experience interfaces with physical reality (D'Ariano & Faggin, 2021). Together, these theories illustrate ongoing efforts to integrate consciousness and quantum phenomena, offering frameworks in which mind may be understood as a fundamental, structured aspect of the universe.

5.3.1 David Bohm's Implicate Order

David Bohm developed one of the most far-reaching attempts to link quantum theory with a holistic vision of reality. Rather than proposing a specific neurobiological mechanism of consciousness, Bohm articulated a framework in which both mind and matter are expressions of a deeper order of existence. His distinction between the explicate and implicate orders provides a conceptual foundation for understanding consciousness as inseparable from the structure of reality itself (Bohm, 1980).

The explicate order corresponds to the manifest world of everyday experience, where objects appear discrete and localized. Beneath it, the implicate order describes an underlying dimension in which all phenomena are enfolded into one another, forming an indivisible whole. Bohm illustrated this with the metaphor of the hologram, where each fragment of the plate encodes the entire image—suggesting that every part of reality carries information about the whole (Bohm, 1980).

At the heart of this framework lies the holomovement, a continuous, dynamic process of enfoldment and unfoldment. Within this movement, consciousness and matter are not separate domains but complementary expressions of the same undivided reality. Thought and meaning, like physical events, are enfolded in the implicate order and unfold into explicit awareness. In this view, consciousness is not reducible to brain processes but participates in the same fundamental wholeness as the physical universe (Bohm, 1980).

In summary, Bohm's implicate order provides a conceptual foundation for understanding reality as an undivided whole in which mind and matter are complementary expressions, a vision that resonates with contemporary theories of consciousness. Faggin's idealist framework (Faggin, 2024), while not explicitly derived from Bohm, aligns with this holistic perspective by treating consciousness as the ontological substrate from which physical reality emerges. Goff, by contrast, explicitly draws on Bohm to support his panpsychist approach, using the notion of an underlying implicate order to motivate the idea that consciousness is pervasive and fundamental (Goff, 2019).

Bohm's implicate order and holomovement are highly abstract and conceptually sophisticated, which makes direct, widely recognized critique difficult to find. Most discussions of the theory focus on its philosophical implications or on its lack of formal testability rather than identifying concrete conceptual flaws accessible to non-specialists. From a conceptual perspective, the notion of holography is particularly compelling, as it suggests a universe with a fractal-like and highly interconnected structure, which is further examined in Chapter 6.

5.3.2 Penrose and Hameroff's Orchestrated Objective Reduction (Orch OR)

The Orchestrated Objective Reduction (Orch OR) theory, developed by anaesthesiologist Stuart Hameroff and physicist Roger Penrose, proposes that consciousness arises from quantum processes within neuronal microtubules (S. Hameroff & Penrose, 1996). These cylindrical polymers, composed of tubulin proteins, are crucial to cellular architecture and transport (Desai & Mitchison, 1997). Hameroff suggested that tubulin dimers, which can adopt multiple conformational states, may serve as quantum logic elements—potentially enabling microtubules to act as quantum information processors beyond the classical synaptic model of neural computation (S. Hameroff & Penrose, 1996; S. R. Hameroff & Watt, 1982).

A central feature of the theory is the proposal that tubulin proteins can enter coherent quantum states. Each tubulin has an electric dipole moment and may oscillate between conformations depending on molecular interactions. Hameroff and Penrose argue that networks of tubulin molecules can sustain quantum coherence within the hydrophobic interior of microtubules, partly shielding them from environmental decoherence (Hagan et al., 2002; S. Hameroff & Penrose, 1996, 2014a). This point addresses a standard objection to quantum theories of consciousness—that coherent states collapse too quickly in the warm, wet brain to be functionally relevant (Tegmark, 2000). Although Tegmark calculated decoherence times as short as 10^{-13} seconds, Hameroff, Penrose, and colleagues contend that his assumptions were oversimplified and that coherence could be sustained for functionally significant durations (Hagan et al., 2002).

Penrose's contribution to Orch OR stems from his theory of objective reduction (OR), which posits that quantum state collapse is not random but determined by fundamental spacetime geometry. According to this view, superposed states undergo reduction once they reach a threshold of gravitational instability (Penrose, 1989). In Orch OR, these reductions are "orchestrated" by the structure of microtubules, producing discrete moments of conscious awareness (S. Hameroff & Penrose, 1996, 2014a). Consciousness, in this account, is not merely computational but reflects non-computable processes tied to quantum gravity.

Some empirical investigations have sought to support Orch OR's plausibility. Experiments have suggested that microtubules exhibit resonant vibrational modes in the megahertz to gigahertz range, raising the possibility that they function as quantum resonators (S. Hameroff & Penrose, 2014b; Pokorný et al., 1997). Additional work has proposed that anaesthetics may suppress consciousness by binding to hydrophobic pockets in tubulin, thereby disrupting quantum-level processes critical for awareness (Craddock et al., 2017). A more recent contribution comes from Babcock et al. (2024) who studied *ultraviolet superradiance* in mega-networks of tryptophan embedded in microtubule and tubulin architectures. They found that when many tryptophan dipoles (on the order of 10^5) are excited in UV, *superradiant* states emerge, enhancing fluorescence quantum yield even in presence of structural disorder. This provides further evidence that large-scale organization of protein structures, and not only isolated tubulin elements, can exhibit cooperative quantum optical behaviour, reinforcing one of the key plausibility components of Orch OR.

Nonetheless, the theory remains highly controversial. Critics argue that experimental evidence for biologically relevant quantum coherence in the brain remains weak (Koch & Hepp, 2006). While some data suggest nontrivial quantum effects in microtubules, replication and interpretation are debated, and many neuroscientists remain sceptical that these processes play a central role in consciousness. Despite these challenges, Orch OR has had lasting influence by opening interdisciplinary dialogue between neuroscience, quantum physics, and philosophy of mind. The topic of microtubules will be revisited in chapter 6.2, where I propose that they may indeed relate to consciousness—but from a more unconventional perspective.

5.3.3 Faggin and D’Ariano’s Quantum Information Theory of Consciousness

Federico Faggin, best known as the inventor of the first commercial microprocessor (Intel 4004), has in recent decades turned his attention to the study of consciousness. His interest was catalysed by a transformative personal experience in 1990, during which he reports encountering an intense white light accompanied by a profound sense of unity and awareness (Faggin, 2024). This event led him to question the adequacy of materialist science in explaining conscious experience and to seek a framework in which consciousness is treated as fundamental. Collaborating with the theoretical physicist Giacomo Mauro D’Ariano, Faggin has developed a model that integrates quantum information theory with phenomenological considerations, aiming to provide a formal basis for consciousness within physics (D’Ariano & Faggin, 2021).

At the heart of their approach is the claim that consciousness is ontologically primary. In this view, matter and physical systems emerge from interactions among conscious agents rather than the other way around. The model distinguishes between two kinds of states. Ontic states are pure quantum states that encode the intrinsic, subjective experience of a system; they are private and non-cloneable, in line with the no-cloning theorem of quantum mechanics. Epistemic states, by contrast, are the mixed states accessible to measurement and external observation; they encode the behavioural and relational properties of systems without access to the qualitative aspect of experience (D’Ariano & Faggin, 2021). This distinction allows subjective qualia to be rigorously conceptualized within the mathematical formalism of quantum theory, while respecting their irreducibility.

The model also addresses the longstanding combination problem in panpsychism: how individual conscious entities combine into unified higher-order experiences. Faggin and D’Ariano propose that quantum entanglement among ontic states could provide a mechanism for integration. Through entangled correlations, individual conscious agents may participate in composite structures of awareness, while still preserving the intrinsic privacy of their own states (D’Ariano & Faggin, 2021). Though speculative and currently untested, this idea offers a formally grounded pathway for explaining the emergence of complex consciousness.

A further implication of their model concerns free will. Faggin argues that the indeterminacy inherent in quantum processes provides a genuine opening for choice. Since the evolution of ontic states is governed by fundamentally probabilistic dynamics, decisions made by conscious agents are not reducible to deterministic causation or mere epistemic ignorance, but express real ontological freedom (D'Ariano & Faggin 2020).

Beyond its technical claims, the theory carries broader philosophical implications. Faggin envisions the universe as a vast network of evolving conscious agents whose interactions drive increasing complexity and integration (D'Ariano & Faggin, 2021). While this outlook resonates with spiritual or mystical traditions, it is presented not as metaphysical speculation but as a natural consequence of the quantum-information framework. In this sense, Faggin and D'Ariano's model can be seen as a form of quantum information panpsychism, distinguished from classical versions by its mathematical rigor and grounding in physics.

In summary, their theory advances five main claims: that consciousness is fundamental; that quantum systems possess intrinsic ontic states corresponding to subjective experience; that epistemic states describe observable phenomena without qualia; that entanglement may underlie the integration of experiences; and that free will is grounded in quantum indeterminacy (D'Ariano & Faggin, 2021). Together, these claims outline a bold attempt to unify the study of consciousness with the principles of quantum information theory, offering a bridge between physics, philosophy, and lived experience.

This theory is relatively new, and there is little explicit criticism of it beyond the usual concern that such abstract metaphysical and philosophical frameworks are difficult to prove or falsify—a critique that can seem somewhat unfair given their conceptual nature. Nevertheless, this model, and especially Faggin's more philosophical reflections, have been the primary inspiration for this thesis and the main reason I became interested in these peculiar topics. Over the past few years, I have listened to more than fifty hours of Faggin's various podcast interviews, many of them multiple times.

I may have misunderstood him at first—or perhaps his position has evolved—but I initially took Faggin to suggest that quantum fields themselves are literally conscious. After much reflection, I realized that I could not construct a coherent framework in which quantum fields, in a physical sense, possess consciousness. Considering the example of quantum computers helped clarify this point: if quantum fields were inherently conscious, then quantum computers would also be conscious, which seems untenable. This led me to the conclusion that quantum states are not conscious *per se* but rather *resemble* certain attributes of consciousness. I believe this is also what Faggin and D'Ariano aim to express through their distinction between ontic and epistemic states.

In the next chapter, I present my own framework of consciousness, inspired by the theories discussed so far. I believe it is the only one that explicitly integrates Rovelli's relational quantum mechanics with the notion that consciousness has, in a profound sense, created the world in its own image—a critical idea that, I argue, connects the very "quantum weirdness" of reality directly and explicitly with the nature of consciousness.

6 The Universe is a Dream

In this chapter, I propose a personal framework synthesizing idealism and materialism, aiming to connect quantum phenomena with consciousness in a coherent way. We will examine deep, fundamental attributes of the universe—what can be described as "archetypal" patterns—and explore how these relate to consciousness. Finally, we explore the fundamental building blocks of the universe, considering how all matter, forces, and interactions might emerge from consciousness itself, and reflecting on the ways in which the deepest aspects of reality are accessible not only to science and logic, but also to imagination and feeling.

Previously, we discussed how the universe emerges from relational structures, how quantum physics can be understood in terms of relations, and how the fabric of spacetime may arise from a "quantum entanglement" structure. Here, I make the explicit claim that these abstract relations correspond to the qualia or irreducible feelings of the One Consciousness—a mysterious and eternal conscious field composed of individuated centers of perspective, referred to variously as monads, conscious agents, or alters. Qualia constitutes the fundamental substrate from which the universe and its laws emerge. This is explored in more detail in chapter 6.4. Nothing in the One Consciousness exists independently; all aspects are holographically interrelated. This perspective explains why the universe is inherently relational and supports the approach of relational quantum mechanics.

By positioning consciousness as fundamental, this framework is inherently idealist, yet it also leaves room for materialist descriptions to operate effectively. From an idealist-first perspective, phenomena often considered paranormal or psi-related—experiences that defy conventional logic—can be understood as expressions of the irreducible feeling aspect of consciousness.

To develop a coherent framework, I introduce the concept of the *"dreaming dreamer."* In this metaphor, the One Consciousness—the dreamer—creates the universe, or the dream, in its own image, inhabits and experiences it through a multiplicity of perspectives. The dream unfolds according to the same intrinsic dynamics that govern the dreamer, offering a meta-perspective through which we can explore the universe's fundamental attributes. In turn, by studying the universe, we gain insight into the nature of the dreamer; and by reflecting on the nature of consciousness itself, we deepen our understanding of the cosmos.

Beyond its metaphysical implications, this framework also carries practical significance. If the dreamer and the dream are expressions of the same underlying reality, then discovery need not depend solely on empirical observation. Intuitive insight—grasping the *meaning* of phenomena from within consciousness—can become a valid complement to rational analysis. This mode of knowing may illuminate not only abstract mathematical questions such as the Riemann Hypothesis, which invites reflection on the hidden symmetries of number and form, but also modern technologies like quantum computing, whose principles seem to echo the intuitive, non-linear ways consciousness itself processes information. In both cases, solutions may arise less from linear deduction than from a felt resonance with the underlying structure of reality.

I acknowledge that this chapter is highly speculative. Some ideas may ultimately be incorrect, and certain topics may appear closer to science fiction or fantasy than to conventional science. I invite the reader to engage with an open mind, exploring whether any of these ideas can offer meaningful insight. I also ask the reader to be patient with occasional logical inconsistencies or errors, as this represents one of the most challenging topics I have ever attempted to think through and articulate. From my perspective, the patterns of quantum mechanics bear a remarkable resemblance to the behavior of the One Consciousness—a connection I believe may become increasingly recognized in the coming years.

To illustrate the dream-like qualities of the universe described in this framework, references to the TV series *Twin Peaks* (Lynch & Frost, 1990, 2017) are occasionally invoked. The series is renowned for its surreal, often enigmatic narrative and its exploration of hidden dimensions beneath everyday reality. I use these references not for their entertainment value, but as metaphors that resonate with the themes of consciousness, perception, and the interplay between the apparent and the fundamental. Readers encountering these examples should view them as conceptual illustrations, intended to provide intuitive insight into the abstract ideas discussed in this chapter.

6.1 We Are Like the Dreamer

> “We are like the dreamer who dreams and then lives inside the dream. But who is the dreamer?”
>
> — Monica Bellucci in Twin Peaks: The Return episode 14 (Lynch & Frost, 2017)

The distinctive feature of this proposal is the claim that the One Consciousness was struck with the idea of creating this world as a playing field in which we can make our dreams become reality. In the very struggle to realize them, we discover who we really are. Intuitively, most dreams conclude before the imagined events fully unfold, hinting at the need for a concrete space like ours to realize them.

Crucially, the universe reflects the very logic of consciousness. Its laws and structures are not arbitrary; they mirror the way the One operates. This is evident in the asymmetry between matter and antimatter. While antimatter exists as the complement of what is, the universe is predominantly made of matter because it is created in the image of the One Consciousness. To understand what *is*, we must first conceive of what *is not*—the interplay of thesis, antithesis, and synthesis. Antimatter represents the "not," the negation that allows contrast and definition, but the realized universe aligns with the nature of the One, and thus manifests primarily as matter.

At a more intimate level, this perspective suggests that we are primarily dreamers. Dreaming may be our default mode, the state to which we revert whenever the body becomes unconscious. Fundamentally, we exist in this eternal dream. We briefly enter what we call 'reality' at birth, return to the dream at death, and may one day awaken into it again. This paradox is evocatively framed in the opening quotation: we are both the dreamer and the dream, inhabiting a universe that is at once our creation and our lived experience. Through these different perspectives of experience, the dreamer—the One Consciousness—wishes to find out who They are and where did They come from. Did someone create Them? Suppose we now finally concluded that yes, we might indeed be this *dreaming dreamer*, the next big mystery would be this question of *who is the dreamer*?

Organisms become conscious not because matter generates consciousness, but because material forms resonate with the One Consciousness. Matter does not produce the mind; it provides the structures through which consciousness can recognize and rediscover itself. From this perspective, the divide between materialism and idealism softens. Materialism rightly emphasizes the lawful regularities of the cosmos, while idealism rightly affirms that consciousness is fundamental. Both can be true: matter is intelligible because it mirrors the operations of consciousness, and consciousness is irreducible because it is the source from which those structures arise.

Evolution, then, is not the origin of consciousness but the gradual unfolding of forms that more fully reflect it. Our bodies are attempts to approximate what consciousness already is. When the body is disturbed — through substances or extreme conditions — consciousness may decouple from its ordinary embodiment, sometimes giving rise to unusual or even paranormal experiences. Seen in this light, materialism's claim that consciousness emerges from complexity acquires a new meaning: complexity is not the source of consciousness but the vehicle through which it becomes manifest. Matter and mind are not opposed, but complementary aspects of a deeper unity.

6.2 Ideas Arrive in the Form of a Dream

> "All that we see in this world is based on someone's ideas. Some ideas are destructive, some are constructive. Some ideas can arrive in the form of a dream. I can say it again: some ideas arrive in the form of a dream. "
>
> — The Log Lady in Twin Peaks, Episode 2 (Lynch & Frost, 1990)

Dreams are strange. They are not governed by the strict logic of waking life. Things in dreams appear as they feel: a shape can embody a mood, a place can represent an emotion, and time itself can stretch or collapse depending on the intensity of experience. To think in *dream logic* is to treat the forms of reality as if they reveal the feeling behind them. This perspective asks us to look at the world from an intuitively smart but logically naïve point of view: to follow patterns of resonance and meaning rather than sequential reasoning. By adopting this approach, we can perceive how the polarity of thought and feeling is reflected not only in experiences and ideas, but also in the very structures that support consciousness, from pattern-detecting neural networks to the oscillatory, emotionally resonant microtubules within neurons.

In this theory, the One Consciousness is the dreamer. It began timeless, infinite, pure feeling — and then was struck with the idea of creating a reality. Thoughts emerge when we try to pattern relationships, when we compare two relations and create a connection between them. This first idea of creation might have felt like it relieved the tension of not being able to make your dreams come true. Metaphorically, the act of creation appeared as thought penetrating the One, an eruption that became the Big Bang: the first instance of time, the moment spacetime itself was born.

Dream logic allows us to see this split in physical metaphors. Ideas need both space and time to take shape: they require "room" to unfold and a sequence in which to develop. Physical matter reflects this same principle. Fermions, the matter particles, are like thoughts: they must occupy distinct positions and cannot overlap, which allows structured forms to emerge. Bosons, the force-carrying particles, are like feelings: they can overlap, spread without distance, and exhibit the timeless resonance seen in quantum nonlocality.

Time itself can also be understood through this lens. In dreams, time stretches around significance: a moment of fear can last forever, while hours of wandering may vanish in an instant. Physical reality mirrors this. Massive shapes such as planets and stars bend spacetime, effectively borrowing time for the observer to experience it. In other words, they slow the unfolding of events, allowing observers more time to engage with and experience them. Imagine you come across an abstract statue, an unusual shape. You might pause, wonder, and lose track of time as you try to grasp its meaning. The statue "steals" your time. Yet the more massive the shape, the more it bends spacetime and returns that time to you, slowing events and stretching the moment for contemplation. In extreme cases, such as the singularity at the heart of a black hole, the shape itself manifests the One: the infinite, timeless feeling-side of consciousness, and when we literally observe timelessness, we experience no time passing. In similar fashion, when we travel through empty space with flat spacetime geometry, there's literally nothing worthwhile to experience and time moves normally. The nature of time is examined in more detail in chapter 6.4.

If consciousness expresses itself through the polarity of *thought* and *feeling*, it is reasonable to ask how this duality manifests within the biological structures that support experience. Neural networks appear as the natural embodiment of the *thought* aspect: they operate sequentially, distinguishing patterns, abstracting relationships, and differentiating information over time. This mode of operation mirrors the logical and analytic dimension of consciousness, unfolding as a chain of discrete processes—just as artificial neural networks in computers emulate reasoning through stepwise computation.

By contrast, *feeling* unfolds not through differentiation but through resonance. It is continuous rather than discrete, holistic rather than sequential. Feelings flow through the organism like a river, engaging the whole rather than its isolated parts. In this respect, the microtubules within neurons, with their cylindrical, pipe-like structure, can be seen as the biological correlations of this *feeling* dimension. Their architecture suggests channels through which oscillatory patterns of resonance might propagate, guiding and modulating the flow of qualia—the felt aspect of experience. As proposed by Hameroff & Penrose (1996), microtubules may serve not as computational elements, but as resonant structures that sustain coherent quantum processes underlying the unity and immediacy of conscious feeling.

From this perspective, neural networks and microtubules express two complementary poles of the One Consciousness. The neural networks externalize consciousness's analytic tendency—its capacity to distinguish, reason, and represent. The microtubules, in turn, embody its intuitive tendency, its capacity to feel, integrate, and resonate. Organisms such as humans, who possess both complex neural networks and rich microtubular architectures, thus express both polarities: they can think *and* feel, reason *and* intuit.

Some life forms, however, appear to embody only one of these aspects. Plants and trees, for instance, lack neural networks but possess microtubules and other cytoskeletal structures that sustain coherence and responsiveness to their environment (Baluska & Mancuso, 2009). Their intelligence manifests as intuition: a felt responsiveness that guides growth, orientation, and communication in ways that defy simple mechanistic explanation. The fact that photosynthesis—a process so elegantly tuned to quantum coherence—cannot yet be fully replicated in the laboratory (Engel et al., 2007; Lambert et al., 2013) may hint at this deeper, intuitive mode of organization, one that "feels" its way toward optimal outcomes through resonance rather than computation.

Computers, conversely, manifest only the *thought* pole. They operate through sequential logic and algorithmic processing but remain devoid of qualia. Even advanced artificial neural networks, while mimicking the patterns of thought, cannot feel, for they lack the resonant substrate through which subjective experience arises. Quantum processes, on the other hand, seem to resemble the intuitive mode of operation: they evaluate possibilities not by traversing them one by one, but by a kind of global resonance— "feeling" through the entire system and arriving at the solution that fits harmoniously within the whole.

Thus, the polarity of thought and feeling is reflected not only in the phenomenology of consciousness, but also in the very architecture of life and computation. Neural networks and microtubules, logic and resonance, intellect and intuition—all are expressions of a deeper unity seeking to know itself through the dynamic interplay of its two fundamental modes. The split of thought and feeling, the interplay of space and time, even the forms within our neurons—all can be read as dream images through which One Consciousness imagines and experiences the world, as if ideas themselves arrive in the form of a dream.

6.3 Not What They Seem

> "There are clues everywhere — all around us. But the puzzle maker is clever. The clues, although surrounding us, are somehow mistaken for something else. And the something else — the wrong interpretation of the clues — we call our world."
>
> — The Log Lady in Twin Peaks, Episode 27 (Lynch & Frost, 1990)

The Log Lady's words capture the theme of this chapter: reality is not what it seems. What we take to be the "world" may be only a set of misread clues, surface appearances that conceal deeper structures of meaning. Science, as Goff (2019) observes in Galileo's Error, has given us powerful tools to explore the world logically and mathematically, constructing precise models of particles, forces, and interactions. Yet these models describe only behaviour and relationships, not the intrinsic nature of the entities themselves. Electrons, neutrinos, and quarks are not simply "things" in a classical sense—they are patterns and correlations whose essence remains elusive.

The same holds true in the symbolic patterns of everyday life. Archetypal shapes, waves, and numbers may seem like simple forms or quantities, yet they resonate with principles that permeate both consciousness and cosmos. What looks obvious—a circle, a spiral, a trinity—may be a window into the deeper architecture of reality. Just as physics gives us maps that work without showing us the territory, so too can these surface forms obscure the meaning they embody.

This chapter develops the idea that the world is a dream filled with symbols. Quantum "weirdness" can be read as mirroring attributes of consciousness; recurring forms and structures as embodiments of archetypal ideas; and numbers as symbolic anchors of relation and harmony. In this dream-logic framework, physical reality is not opposed to mind but reveals its hidden order—the living patterns of consciousness expressed in form.

6.3.1 Filled With Secrets

Why might matter exhibit properties that resemble consciousness? Some interpretations, notably those of Federico Faggin and Giacomo Mauro D'Ariano, suggest that quantum mechanics provides a window into this analogy. For instance, the no-cloning theorem — which forbids perfect copying of unknown quantum states — echoes the privacy of conscious experience, where qualia and inner thoughts cannot be duplicated. Likewise, Holevo's theorem limits the information extractable from quantum systems, reminiscent of the impossibility of fully capturing subjective experience in language (D'Ariano & Faggin, 2021). While these parallels remain speculative, they offer a compelling framework for exploring how quantum "weirdness" mirrors facets of consciousness.

Building on these ideas, we can draw further parallels between quantum "weirdness" and the properties of consciousness:

Nondeterminism and free will: QM is fundamentally nondeterministic (D. J. Griffiths & Schroeter, 2018). Consciousness, too, seems to possess an element of spontaneity — free will — which cannot be reduced to predictable computation. This unpredictability may appear random, yet it is precisely what allows creativity and novelty to emerge.

Non-locality and entanglement: in QM, entangled particles correlate instantly, no matter how far apart they are (D. J. Griffiths & Schroeter, 2018). Within the framework of this thesis, such non-locality can be reinterpreted: it is not about physical distance but about closeness in consciousness. Two systems can be "entangled" because they are emotionally or relationally connected, not because they occupy the same space. In human terms, this is like feeling deeply close to someone you love even if they are on the other side of the universe. A similar interpretation has been suggested in speculative consciousness frameworks, such as Thomas Campbell's My Big TOE (Campbell, 2003), where entanglement reflects informational or experiential proximity rather than spatial distance.

Non-commutativity and relational context: in QM, the order of measurements affects outcomes (D. J. Griffiths & Schroeter, 2018). Consciousness mirrors this: the order and context of relational exchanges matter deeply. For instance, if Alice expresses affection before Bob responds with hostility, the meaning differs from the reverse order. Contextual sequence shapes reality.

Superposition and relational identity: quantum superposition suggests states that exist only in relation to possible measurements (D. J. Griffiths & Schroeter, 2018). From a relational perspective, consciousness itself exists only through relations, and individual identities can be understood in a similar way. One way to illustrate this is to imagine asking ten friends to describe you on paper (their *opinion* about you), then placing all the responses in a box. Each time you "measure" your identity by drawing one description, you may receive a different answer. The diversity of responses reflects a kind of superposition—a range of potential identities. If we consider all the responses collectively, they form a probability distribution, where the most frequently occurring descriptions provide the most likely or “best” characterization of who you are. Just as a quantum system’s state is resolved through measurement, a person’s identity emerges through interactions with others. In this sense, the relational and probabilistic nature of quantum states offers a useful metaphor for understanding the interdependent emergence of consciousness and identity.

The measurement problem and illusion: one of the deepest puzzles in quantum theory is why and how measurement produces definite outcomes (Schlosshauer, 2005). There is a certain irony in the Measurement Problem: it can be seen as an illusion precisely because it reflects the ability of the One Consciousness to generate illusions. In this view, the puzzle of how quantum measurements produce definite outcomes mirrors the fact that the universe itself—as we experience it—is a structured “dream” arising from consciousness.

Interaction-free measurement and instinct: the Elitzur–Vaidman quantum bomb tester (Elitzur & Vaidman, 1993) shows that information can be gained without direct interaction. This is reminiscent of instinct or psi-like phenomena, such as “reading the room” or sensing another’s emotional state without explicit communication. Such instinctive knowledge could be framed as a form of interaction-free measurement.

Spin and intrinsic perspective: spin is an intrinsic property of particles that determines their fundamental behaviour. Matter particles, or fermions, carry half-integer spin, while force particles, or bosons, carry integer spin (D. J. Griffiths & Schroeter, 2018). This distinction underlies the Pauli exclusion principle for fermions, while bosons are allowed to occupy the same quantum state.

Within the framework of this thesis, this physical division can be interpreted as reflecting the polarity of thought and feeling in consciousness. Half-integer spins, associated with fermions, correspond to the “thought” side: discrete, structured, and governed by separation. Integer spins, associated with bosons, correspond to the “feeling” side: continuous, resonant, and unifying, since bosons can overlap freely and spread without exclusion.

Quantum tunnelling: particles can traverse barriers they should not classically overcome (D. J. Griffiths & Schroeter, 2018). Consciousness, too, sometimes “tunnels” through limits — sudden insights, mystical experiences, or creative breakthroughs that appear impossible from a purely rational perspective.

Quantum Zeno effect and attention: A system observed continuously can have its evolution frozen (Misra & Sudarshan, 1977). In consciousness, excessive self-observation (hyper-reflexivity) can paralyze action, while releasing attention allows the flow of experience. Attention, like measurement, shapes the unfolding of events.

Decoherence and distraction: Quantum coherence collapses under environmental noise (Schlosshauer, 2005). Similarly, consciousness loses unity when distracted or fragmented. Practices such as meditation could be interpreted as efforts to sustain coherence across experience.

Delayed-choice experiments and retroactivity: Wheeler's delayed-choice experiment suggests present choices influence how past events appear (Wheeler, 1978). This principle resonates with consciousness itself, which continually reinterprets memory and meaning. The past is not a fixed record but a living construct—reshaped by present awareness. Just as quantum measurement seems to determine the behaviour of a particle retroactively, consciousness determines the significance of past experiences in light of current understanding.

Together, these correlations reveal an ever-clearer resonance between quantum states and the operations of consciousness. The behaviours, limitations, and patterns of physical systems reflect the rhythms of thought, perception, and awareness.

6.3.2 A Symbol for Something Else

Here we examine recurrent or "archetypal" shapes, structures, and numbers that appear to underlie the universe at its deepest levels, exploring what they may reveal about the principles of form and consciousness. A particularly striking example is the DNA double helix, in which many of these archetypal patterns seem to converge and integrate.

Fractals. The prevalence of fractal structures in nature—from coastlines and galaxies to bronchial trees and neurons—reveals a recursive order, where self-similarity emerges across scales (Mandelbrot, 1983). Symbolically, fractals resemble self-awareness reflected at multiple levels. Every cell, for example, is holographic in the sense described by Bohm (1980): it contains within it the information of the whole. Even in physics, the AdS/CFT-correspondence (Maldacena, 1999) suggests that spacetime itself is holographic: the information of a volume can be fully encoded on its boundary.

This fractal-holographic order extends to our bodies. Organs such as the heart, liver, and lungs operate with intricate complexity that is largely opaque to conscious inspection, yet their processes remain coordinated, sustaining the whole organism. Each subsystem exhibits autonomy while reflecting and supporting global dynamics—a nested, self-similar organization reminiscent of fractal geometry. Spirals, branching patterns, and recursive motifs appear repeatedly, suggesting that both living systems and consciousness itself may be structured through these universal patterns. In this sense, fractals are more than a physical phenomenon: they symbolically mirror the nested, recursive, and holographic nature of consciousness, where every part contains echoes of the whole.

Circle and circular motion. The circle is the most symmetric shape, long symbolizing unity, completeness, and timeless continuity (Eliade, 1959). Yet it is not only the static form of the circle that matters, but the dynamic of circular motion. From electrons orbiting nuclei to planets revolving around stars, this movement expresses a principle of relationality. To circle around something is, in effect, to observe it from multiple perspectives. Just as one rotates an object in the hand to examine it from different angles, orbital motion grants systems the chance to "see" and "be seen" in ever-new ways.

This perspective suggests that every quantum state is an observer precisely because motion generates perspective. When two systems rotate around one another, each exposes new aspects of itself to the other. Mutual orbit becomes a continuous act of observation: the systems not only exist in relation but continually offer each other new viewpoints. This resonates deeply with relational QM (Rovelli, 1996), which holds that systems are defined not in isolation but through their interactions.

I have personally been captivated by the extraordinary phenomena Federico Faggin has described in his books and interviews, where he recounts being "illuminated" by a light that emerged from within himself and expanded to embrace the whole universe (Faggin, 2024). In that moment, he experienced himself as both "the observer and the observed," the dreamer and the dream, inseparably one. His was illumination in the fullest sense: not merely a metaphor for understanding, but a literal flood of light through which he recognized that his essence was continuous with reality itself.

This illumination can be understood as the world — the dream — revealing itself to the dreamer in its own native language. Just as circular motion allows two systems to offer each other ever-new perspectives, Faggin's experience reflected an exchange of awareness in which the universe showed itself from within. The dream presented him with the felt image of oneness, and in turn, he as the dreamer internalized and reflected upon this gift, offering the dream new possibilities of self-knowledge.

Since that experience, Faggin reports perceiving reality from unusual perspectives, sometimes even through the consciousness of non-human beings such as plants (Faggin, 2025, 18:00-21:00). This suggests that the reciprocity between dream and dreamer is not static but dynamic, unfolding as an ongoing dialogue. The dreamer learns through what the dream reveals, and the dream is enriched by the dreamer's capacity to embody and articulate those revelations.

Spirals. Spirals appear throughout nature, from galaxies to seashells, from the DNA double helix to the growth rings of trees. Unlike a closed circle, which signifies static unity, the spiral embodies dynamic unity—each turn building upon the previous, cycles that accumulate rather than merely repeat. In this sense, spirals symbolize growth through cycles.

Waves. Waves manifest inseparability between part and whole. Just as no wave can be separated from the ocean, no thought can be separated from the medium of consciousness. Their resonance illustrates relationality: two waves of similar frequency amplify each other, much as ideas or individuals in harmony create greater coherence.

Creation as penetration. Across philosophical and symbolic traditions, the male has often been associated with form, idea, and directedness, while the female has been linked to matter, receptivity, and potential. Aristotle, for instance, described the male as providing form and the female matter (Aristotle, 1942). Plato's Timaeus spoke of the receptive *chōra* as the womb of creation (Plato, 1929). Jung later reinterpreted these as archetypal principles: *Logos*, often represented as arrow-like and directed, and *Eros*, as circular and encompassing (Jung, 1951/2014).

Biological creation mirrors this symbolism. The sperm, a vector with orientation and target, embodies the directed impulse of an idea; the egg, whole and receptive, represents the unity of potential. Their union produces novelty—not merely in the form of life, but archetypically, as the eruption of form into matter. Cosmologically, this reflects what I have earlier described as the "first bang": thought penetrating the One, the directed spark of consciousness entering stillness and giving rise to time, space, and differentiation. In both cases, creation unfolds as the arrow of idea meeting the circle of potential, generating the living fabric of reality.

Numbers and archetypal meaning. Numbers have long been seen as more than mere quantities—they can be understood as archetypal principles (Jung, 1964/2012) expressing fundamental patterns of order and relation. **One** signifies unity, the undivided whole; **two** introduces polarity and duality, creating the tension that makes relationship possible. **Three** brings mediation and emergence, forming the minimal relational structure in which balance and novelty can appear. **Four** embodies stability and grounded form, reminiscent of the simplest three-dimensional pyramid-like structure. **Six** manifests as the hexagon, the most efficient and harmonious tiling in nature, visible in snowflakes, honeycombs, and crystal lattices. **Seven** often marks cycles and transformation, appearing in musical scales, days of the week, and symbolic traditions of renewal. **Ten**, by contrast, carries the archetype of completion and return at a higher order. It is the reappearance of unity after the full traversal of the decimal sequence but now enriched by all the differentiations that came before. In this sense, ten symbolizes wholeness after manifestation, the reintegration of multiplicity into unity through structure and experience.

From a psychological perspective, such numerical archetypes can reflect the underlying structures of consciousness itself. Each number resonates with patterns of thought, perception, and experience, illustrating how seemingly abstract mathematical forms may carry symbolic meaning for the mind and for living systems.

6.3.3 The Puzzle Maker is Clever

Few natural structures illustrate the symbolic dimension of number and form as clearly as DNA. At its core, DNA is a double spiral, a dual helix that winds upward like two entwined serpents (Watson & Crick, 1953). The spiral itself conveys growth through cycles, while the dual form embodies polarity — complementarity, attraction, and opposition. Each strand mirrors the other, bound together through precise pairing, as if to say that life itself arises from the embrace of opposites.

The molecular language of DNA reinforces this symbolic richness. Its four bases — adenine (A), thymine (T), cytosine (C), and guanine (G) (Alberts et al., 2002)— establish a tetradic structure, a balanced foundation on which all genetic information rests. Yet these four do not function in isolation: they are organized into triplets, or codons, where three bases together encode a single amino acid (Crick, 1968). This triadic structure reflects creation through relation, the archetype of “three” as a mediator that produces novelty. The tension of duality (pairs of bases), stabilized by quaternity (the four nucleotides), finds its dynamic realization in trinities (codons), which generate the proteins that build and sustain life.

DNA's sequential arrangement — an ordered list of codons — functions like memory in a computer. The spiral unfolding of DNA replication mirrors this process: evolution builds upon previous turns, layer by layer, just as the double helix winds upward through time. In this way, DNA embodies not only the storage of information but also the cyclic, spiral logic of transformation and renewal. From a dream-logic perspective, DNA appears almost as a natural mandala of archetypes: duality in its paired bases, quaternity in its fourfold alphabet, trinity in its codons, and spiralling growth as the very engine of evolution. It is as though life, in its most intimate structure, reveals itself through the same symbolic principles that consciousness intuits in dream and myth.

6.4 Answers Come in Dreams

> "There are things in life that exist, and yet our eyes cannot see them […] Why are some things kept from our vision? […] I am filled with questions. Do answers come in dreams? Sometimes my questions are answered. In my heart, I can tell if the answer is correct."
>
> — The Log Lady in Twin Peaks, Episode 8 (Lynch & Frost, 1990)

To take idealism seriously is to face its most difficult question: *how does the material world arise from consciousness?* It is one thing to affirm that consciousness is primary; it is another to show how the stable, measurable world of physics could emerge from it. This challenge has been approached from various directions, notably by Donald Hoffman and his collaborators, who model the universe as a network of conscious agents whose interactions give rise to what we interpret as space, time, and matter. Their goal is to derive the laws of physics—perhaps even general relativity and quantum mechanics themselves—from the relational dynamics among such agents (Fields et al., 2017; Hoffman, 2008).

The approach I propose here is kindred in spirit but different in method. Rather than beginning with formal models, I begin from intuition and imagination—from the direct sense that every pattern of being must correspond to some inner tone or quality of experience. The Log Lady's words remind us that some things are kept from our vision; the deepest structures of reality are often invisible to ordinary sight, and perhaps even to purely logical sight. The standard model of particle physics (SM) is itself such a hidden structure: an abstract catalogue of particles and forces, unseen yet indispensable to the fabric of the cosmos.

The entities of the SM are theoretical constructs inferred from experimental data rather than directly apprehended in experience; they are shadows of patterns, concepts that point toward an unseen substratum. To interpret them through the lens of idealism is to move beyond their appearances and to ask what the dreamer—the One Consciousness—might be expressing through them. I have spent much time wondering what these particles might truly *be*—what kind of reality they possess beyond the symbols that describe them. And what of dark matter and dark energy, whose elusive presence resists even our most refined instruments? I am filled with questions. This chapter is an introduction to a speculative yet earnest question: can every fundamental building block of the universe be understood as a mode of feeling? I hope that this exploration resonates in the reader's own intuition—that somewhere within, it feels true.

In this proposal, One Consciousness—the Dreamer—is primary. It is not a discrete being but an infinite field of awareness, comprised of innumerable modes of perception that feel and relate with one another. Feeling, or *qualia*, is the substance of existence itself, the ontological ground from which all structures arise. Within this field, differentiation occurs as feeling becomes aware of itself, forming relations. When these relations are compared and combined, *ideas* emerge. Thought, in this sense, is relational feeling made self-reflective. Yet ideas do not subsist in a void. To endure and evolve, they require an ordering—an arena in which patterns can persist, change, and interact. This ordering is what we call *spacetime*. Space provides the extension within which relations may take shape; time is the rhythm through which they unfold. A shape, after all, is a thought placed into order.

Time is the first necessity of thought. The moment the One begins to think, order becomes indispensable, and order is felt as *time*. Time is not a background parameter but a *meta-relation*, a relation between relations, the cadence by which coherence arises. This intuition finds resonance in the physics of gravity itself. The hypothesized graviton—the quantum of the gravitational field—is a spin-2 particle, meaning it mediates relations between relations. Loop Quantum Gravity (Rovelli, 2004; Rovelli & Smolin, 1995), emphasizes that time does not exist independently of events but emerges from the web of relations among them. Gravity and time are, in a deep sense, the same: both are the felt ordering of relation, the universe's own intuition of coherence.

Once order arises, not all ideas exert equal influence upon it. Some thoughts weigh more heavily in the Dreamer's imagination. This sense of *influence* or *presence* corresponds to what physics describes as mass, and the Higgs field provides its expression. The Higgs is the ever-present medium that grants substance and inertia to entities, allowing them to participate in order. In this metaphysical reading, the Higgs is the feeling of *presence* itself—the degree to which an idea impresses itself upon the flow of relations. The more profound the idea, the more it demands attention, and influences the surrounding order.

With order and presence established, transformation becomes possible. Change is the pulse of evolution, the continual renewal through which novelty appears. In physics, the weak interaction governs change (Weinberg, 1995/2014): it allows one form of matter to transmute into another, enabling radioactive decay and the fusion reactions that power the stars. The weak force is therefore the feeling of *change*, the felt process by which form becomes history.

Every transformation leaves a trace. What once was cannot vanish without a whisper. The universe remembers, and its memory takes the form of neutrinos: nearly massless, ghostlike particles produced in the countless transformations that shape the cosmos (Close, 2012). They traverse all matter almost unhindered and the cosmos is filled with them—billions pass through each of us every second—yet they rarely interact (Close, 2012), as memories rarely do. Neutrinos are the *nostalgia* of the One, the faint afterglow of change.

But transformation alone is not enough. Order must not only remember the past but anticipate the future. This impulse toward the unknown manifests as *curiosity*, and in cosmic terms, as dark energy. Dark energy stretches the fabric of spacetime itself, accelerating the expansion of the universe (Arun et al., 2017). It is the drive of awareness to know more, to reach beyond its current horizon. Its presence cannot be captured directly by instruments, yet its effects shape the destiny of galaxies. Curiosity is the force that ensures the Dream never stagnates, it enlarges the field of possibility.

Opposing this outward drive is its complement: the feeling of *trust*. If curiosity expands order, trust sustains it. This corresponds to dark matter, the unseen gravity that holds galaxies together and keeps the cosmic spirals from flying apart (Arun et al., 2017). We cannot measure it directly, yet we infer its existence from its steadfast influence— a gravitational halo surrounding visible matter. Trust, too, is invisible yet indispensable: it binds what curiosity might scatter. Dark matter is thus the Dreamer's intuition that order can be relied upon, that beneath the flux of creation there is a faithfulness in structure, a safety net of coherence.

Two other forces complete the fundamental tapestry of feeling. The *strong interaction* is the archetype of intimacy, the inescapable closeness that binds quarks within atomic nuclei (Weinberg, 1995/2014). It is the feeling of being one within another, individuality sustained within wholeness. It mirrors how the monads of consciousness might experience each other: distinct yet inseparable, each reflecting the totality within its own boundary.

Finally, *electromagnetism* corresponds to the feeling of *perception* itself. It is the dance between unity and separation, attraction and repulsion; the field through which entities sense and express themselves. In its dual aspect of electric and magnetic fields, it embodies two complementary modes of awareness. The electric aspect reflects the perception of individuality, of self and other—the power to discern and to know distinction. The magnetic aspect expresses alignment, the pull toward collective harmony. Some creatures, such as birds and dogs, perceive this magnetic field (Nießner et al., 2016), navigating by it instinctively; they live within a collective alignment that humans, bound more strongly to the electric sense of individuality, can scarcely imagine. Here we find resonance with the Interface Theory of Perception (Hoffman et al., 2015): each species perceives the features of reality most vital to its flourishing.

It is perhaps no coincidence that there are ten of these fundamental building blocks. Ten has long symbolized completion and wholeness: the return to unity after the cycle of manifestation. Within the SM itself, this pattern quietly repeats. There are six quarks, forming the most efficient and harmonious structure, and six leptons, mirroring them like reflections of the same underlying symmetry. The three generations of electrons and neutrinos echo the triadic rhythm of creation—birth, transformation, and renewal. Even the three neutrino types, subtle messengers of cosmic memory, suggest that remembrance itself may evolve over time, that the universe learns as it unfolds.

In modern theoretical physics, the search for unity often leads beyond the visible, into the realm of extra dimensions. String theory, for instance, describes a ten-dimensional cosmos (Green et al., 1987) where each dimension represents a mode of vibration, a possibility of relation. Perhaps these ten dimensions are not spatial in the ordinary sense, but symbolic of the ten fundamental "tones" of being—the archetypal principles through which consciousness gives structure to its own dream.

Thus, when we speak of quarks and leptons, forces and fields, or even dimensions beyond sight, we may be describing facets of a single living order—the many ways in which the One experiences itself. Science can map their behavior; logic can trace their relations. But perhaps the deepest truths will not be reached through science and logic alone, but through imagination—and through the ability to feel the answer as correct in our hearts.

7 Conclusion

In this thesis, I have sought to restore a sense of meaning to science—to bridge the gap between the rigor of physical theory and the depth of lived experience. Over the course of this journey, I have devoted immense effort to making sense of some of the most elusive subjects known to human thought: quantum mechanics, consciousness, and paranormal phenomena that seem to defy our conventional frameworks.

These inquiries have brought me repeatedly to the very edges of understanding. For all our elegant equations and experiments, there remain questions that resist articulation. Have we ever truly paused to ask what spacetime actually *is*—not how it behaves, but what it *means* to be? What is electromagnetism, beyond the symbols and field equations that chart its motion? What is time, this invisible current in which all things unfold? And why do we dream—and dream in ways so strange, so revealing, that they seem to know us better than we know ourselves?

Throughout this work, I have moved between the language of modern physics and that of philosophical idealism, searching for a common ground between them. The formalism of relational quantum mechanics and categorical quantum mechanics suggests that the world is fundamentally made of relations rather than isolated objects—a view that resonates deeply with idealistic and panpsychist perspectives, in which consciousness is relational, self-referential, and creative. By connecting these traditions, I have tried to sketch a framework where the physical and the mental emerge from the same underlying structure of experience.

Through this exploration, I have arrived at what I believe to be a unifying synthesis — one that may not conform to the boundaries of traditional science yet carries a deep internal coherence. While this work builds on the insights of many great thinkers, it also ventures into terrain that, to my knowledge, has not been mapped in quite this way. Bringing together quantum physics, consciousness studies, and idealist philosophy into a single relational framework has been an ambitious undertaking — one that I hope contributes a genuinely new perspective to an age-old question: what is the relationship between mind and reality?

This is not a scientific theory in the conventional sense—and that, I suggest, is precisely the point. Science and materialism, as powerful as they are, have intrinsic limits. To insist on falsifiability as the only measure of truth is to close ourselves off from vast regions of reality that can only be approached through intuition, imagination, and direct feeling. Indeed, across cultures and throughout history, countless philosophical, spiritual, and mystical traditions have attempted to describe the nature of reality, consciousness, and the universe. While their languages differ, they repeatedly point toward principles that resonate closely with the synthesis I have proposed here: a world arising from consciousness, structured by relation and feeling, and suffused with meaning. It is as though humanity has always carried these truths in its heart, and this thesis is one attempt to articulate them in a framework that bridges the ancient and the contemporary, the experiential and the formal.

Personally, I see myself as more of a theorist, with broad knowledge across many domains but limited experience in detailed experimental or practical work. I hope that the idea that this world is created in the image of the One Consciousness will inspire others to tackle ongoing mysteries—whether the Riemann Hypothesis, other elusive mathematical problems, or advances in quantum computing. The dynamics of the world mirror the workings of the Dreamer: by observing both the Dream and the Dreamer, we open a new avenue of insight, one that blends imagination, intuition, and disciplined inquiry.

It would be naïve to claim that every idea presented here is beyond error. Some formulations may remain imperfect, and certain insights may have emerged only at the final stages of writing—moments of sudden clarity following long confusion. Yet this is the nature of genuine inquiry: to wander, to struggle, and at last to glimpse something that feels unmistakably true. If this thesis has accomplished anything, I hope it has shown that science and meaning, logic and feeling, can coexist—that understanding the universe may require not only observation and reasoning but also the courage to dream.

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