

QUANTUM TAWHEED

**Reality, Consciousness, and
Cosmic Wisdom**

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"Hayal gücü bilgiden daha önemlidir. Çünkü bilgi sınırlıyken, hayal gücü tüm dünyayı kapsar."

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CONTENTS

PREFACE • 7

INTRODUCTION • 11

CHAPTER 1

Building Blocks of Quantum Physics • 15

CHAPTER 2

Fundamental Theories and Phenomena of Quantum Physics • 19

CHAPTER 3

Quantum Physics and the Nature of the Universe • 49

CHAPTER 4

Quantum Physics, Consciousness, and Existence • 53

CHAPTER 5

Quantum Physics and Cosmic Wisdom • 63

CHAPTER 6

Quantum Physics and Metaphysics: The Nature of Reality • 67

CHAPTER 7

Quantum Physics and Daily Life • 75

CHAPTER 8

Conservation of Energy and Quantum Teleportation • 79

CHAPTER 9

Quantum Mechanics and the Structure of the Universe • 85

CHAPTER 10

Quantum Tunneling and Biology • 97

CHAPTER 11

Quantum Mechanics and Other Scientific Theories • 101

CHAPTER 12

The Warp Factor - The Bending of Space and Time • 105

CHAPTER 13

Quantum Time • 109

CHAPTER 14

The Hologram and Quantum • 117

CHAPTER 15

The Multi-Layered Structure: The Human Being • 121

CHAPTER 16

Perception of Reality and Self-Projection • 131

CHAPTER 17

The Mirroring Technique • 145

CHAPTER 18

The Critical Effect and the Command “Kun” • 149

CHAPTER 19

Light and Nur • 155

CHAPTER 20

Sufi Perception and Mystical Experiences • 161

CHAPTER 21

The Levels of the Self (Nafs) • 173

CHAPTER 22

Saints and Quantum • 183

CHAPTER 23

Reality and Cosmic Wisdom • 199

CHAPTER 24

Wave-Particle and Manifest-Hidden (Zahir-Batin) • 211

CHAPTER 25

Glossary of Fundamental Concepts in Quantum Physics • 215

CHAPTER 26

Contributors to Quantum Physics • 231

CONCLUSION

The Mysteries of Quantum and Infinite Possibilities • 239

REFERENCES • 243

"Imagination is more important than knowledge.

For knowledge is limited, whereas imagination embraces the entire world."

— Albert Einstein

PREFACE

The extraordinary reality of quantum feels as if we are peeking into the director's room behind the curtain of the universe. It's like sitting in front of a large puzzle, putting together piece by piece, yet never fully seeing the big picture. Quantum physics is exactly like that; just when you think, "I've got it," Einstein's famous quote comes to mind: "Reality is an illusion, albeit a very persistent one." In the quantum world, this illusion is as important as reality itself. For separating truth from illusion is no different from observing Schrödinger's cat.

Who is this cat, and what does it do? Who observes the cat? Is the cat alive or dead? To know, you must open the box, but that's where the quantum leap comes into play. Perhaps we shouldn't open it, because this leap exists precisely at the boundary between taking one step forward into the unknown cosmos and one step backward in our quest for wisdom. And at this boundary, the infinite games of reality and illusion begin for minds seeking order amidst uncertainty.

Quantum physics, while trying to unravel the deepest secrets of the cosmos, also pushes the limits of our perception. The boundaries of quantum and perception take us on a journey, both to the fundamental building blocks of the universe and deep into our subconscious. It is here that the quantum dream begins. In this dream, everything consists of energy and light, and the dance between these two elements forms the fabric of the universe. Energy and light are in constant motion within the quantum boundaries, much like how our minds continuously question reality and illusion.

But we must remember, we are not the only ones testing these boundaries; the universe plays with us too. This game is enriched by the uncertainty principle. Everything seems to be in its place, yet nothing is where it seems. Perhaps that's why quantum leaps remind us how strange and flexible reality itself can be. In one moment, we are in one place; in the next, we are somewhere entirely different. And it is between these moments that we move within the boundaries of quantum, chasing an ever-changing perception of reality. At this point, we should pause and revisit Einstein's famous words: "Reality is an illusion, albeit a very persistent one." Yes, the weight of these words deepens in the quantum world. When this fine line between reality and illusion merges with the infinite games of quantum and illusion, we feel as if we are living in a dream.

In the end, quantum's extraordinary reality shows us that the universe is not just beyond matter, but hidden within the depths of perception and consciousness. This place holds both truth and illusion, and we are both the observers and the players of this space. Now, the choice is yours; do you wish to join the game of this universe, or would you prefer to remain inside the box like Schrödinger's cat?

INTRODUCTION

Stepping into the depths of the quantum world is a journey into the most mysterious aspects of the universe. "Quantum Tawhid" is a work prepared for those who wish to explore the secrets of quantum physics and the metaphysical dimensions of these mysteries. This book aims not only to

transcend the physical world but also to delve into the depths of human consciousness and spiritual existence.

Quantum physics is a branch of science that studies the behavior of subatomic particles. Yet beyond this field lies groundbreaking theories about how the universe operates. In this book, we cover a wide range of topics, from quantum superposition to quantum entanglement, from the tunneling phenomenon to multiverses. Each concept opens a window that pushes the boundaries of science and brings us closer to an understanding of the fundamental nature of existence. This work is not just a scientific exploration; it is also a spiritual and mystical investigation.

Islamic mysticism, especially Sufism, has developed an understanding that shares deep and surprising similarities with quantum physics. While Sufi teachings focus on the unity of existence and the interconnectedness of all things, quantum physics likewise presents a world where particles are interlinked. Our book stands at the intersection of these two realms, offering both a scientific and spiritual discovery.

Understanding the mysterious nature of quantum physics and its spiritual reflections will be a crucial step in seeking answers to existential questions. While expanding our knowledge of the fundamental nature of the universe, we may also embark on a process of spiritual enlightenment. This book introduces readers to theories that push the boundaries of quantum physics and explores the spiritual reflections of these theories, revealing the profound connections between both fields. From Penrose-Hameroff's Orchestrated Objective Reduction Theory to parallel and multiverses, from Zeno's paradoxes to the quantum nature of black holes, it addresses a broad range of topics to offer a new perspective on the deep mysteries of the universe and existence.

Quantum physics opens the door to a journey that challenges the limits of human perception and delves into the depths of the known universe. Traditional physics may seem sufficient for us to understand the workings of the universe; however, the subatomic world transcends this classical perception and confronts us with an entirely different reality. The disconnect between quantum perception and general perception becomes evident in quantum clustering, one of the most fascinating and perplexing areas of modern science. Here, concepts like wave-particle duality, the uncertainty principle, and superposition present a world that goes far beyond the reality we know. Quantum physics reveals a universe where particles not only exist but also interact with each other, where processes of annihilation and creation are constantly unfolding.

Fundamental components like electrons, protons, and photons are constantly engaged in a dance within this microscopic world. Concepts like spin, conservation laws, and the speed limit form the basic rhythms of this dance. While classical physics has shown the relationship between energy and mass through equations like $E=mc^2$, the quantum world offers new perspectives for understanding reality beyond the atom. Bosons, known as social particles, and fermions, the antisocial particles, interact through quantum leaps. These processes help us understand how the smallest building blocks of the universe are organized and how the fundamental laws of the universe are determined.

The periodic table offers a map of these building blocks, while concepts like leptons, neutrinos, and Feynman diagrams allow us to explore the depths of this map. Quantum physics is not limited to the

subatomic world; it also addresses cosmic phenomena such as black holes, dark matter, and dark energy. Concepts like black bodies, momentum, and quantum tunneling help us better understand this cosmic realm.

Scientists like Bohr, Einstein, Rutherford, Schrödinger, and Maxwell have unlocked the doors to this magical world, and with modern instruments like the Large Hadron Collider, we can explore phenomena like relativity, the Big Bang, and the expansion of the universe.

In this journey to unravel the secrets of the universe, we encounter profound questions like the theory of everything and the multiverse theory. The quantum world, unlike the classical one, is like a game where we must roll the dice each time; however, this game offers us a key to understanding the deepest secrets of the universe.

CHAPTER 1

BUILDING BLOCKS OF QUANTUM PHYSICS

Components of the Atom

Atom: An atom is the smallest unit of an element that retains its chemical properties. Every atom consists of a nucleus and electrons orbiting around it.

Nucleus: Located at the center of the atom, the nucleus is composed of protons and neutrons. Protons carry a positive charge, while neutrons are neutral.

Electrons: These are negatively charged particles that orbit the nucleus. Electrons exist in specific energy levels.

Periodic Table: Atoms are arranged as elements in the periodic table, which defines their chemical properties and atomic structure.

Subatomic Particles

Quarks: Quarks are fundamental particles that make up protons and neutrons. There are three types of quarks: up, down, and others (strange, charm, and top). A proton consists of two up quarks and one down quark, while a neutron consists of two down quarks and one up quark.

Leptons: Leptons are a group of fundamental particles different from quarks. Types of leptons include electrons, muons, and taus. The electron is one of the building blocks of atoms and carries a negative charge.

Bosons: Bosons are force-carrying particles. Photons (which mediate the electromagnetic force), W and Z bosons (which mediate the weak nuclear force), and gluons (which mediate the strong nuclear force) belong to this group. Bosons are responsible for transmitting the fundamental forces.

Neutrinos: Neutrinos are extremely light and weakly interacting particles. There are three types: electron neutrinos, muon neutrinos, and tau neutrinos. Neutrinos interact via the weak nuclear force.

Fundamental Forces

Fundamental forces are the four main forces that govern all interactions in nature.

Strong Nuclear Force: This force holds quarks together within the atomic nucleus. It is a powerful force, effective over short distances (within the nucleus). Gluons are the force-carrying particles for this force. It keeps atomic nuclei stable and plays a role in nuclear reactions.

Weak Nuclear Force: This force governs radioactive decay and certain particle interactions. It is weaker than the strong nuclear force and operates over short distances. W and Z bosons are the force carriers of this interaction. It facilitates processes like beta decay and particle transformations.

Electromagnetic Force: This force governs the interaction between charged particles. It operates over long distances and is responsible for the attraction and repulsion between positive and negative charges. Photons are the carriers of this force. Electromagnetism explains phenomena like electricity, magnetism, and chemical bonds between atoms.

Gravitational Force: This is the force of attraction between masses. Although much weaker than other forces, it can operate over vast distances. Gravitational force is explained by the theory of general relativity and causes the attraction between massive particles. It governs the motions of planets, stars, galaxies, and other celestial bodies.

These four fundamental forces govern all physical interactions in the universe, playing roles in fields ranging from particle physics to cosmology. Each force has different carrier particles and ranges of effect, helping us to understand the diverse interactions in nature.

CHAPTER 2

FUNDAMENTAL THEORIES AND PHENOMENA OF QUANTUM PHYSICS

In classical physics, the universe consists of specific objects moving through absolute time and space. Newton's laws of motion predictably describe the motion and interactions of these objects. For centuries, these laws have been regarded as the foundation of science. However, by the end of

the 19th century, it became clear that classical physics was insufficient to explain the behavior of subatomic particles. Events such as black body radiation and the photoelectric effect demonstrated the need for a theory beyond classical physics.

Quantum theory began with Max Planck's introduction of the idea of energy quanta in 1900. Albert Einstein expanded on this idea by explaining the photoelectric effect in 1905. Niels Bohr made significant progress by reconciling the atomic model with quantum theory. Quantum theory introduced a new worldview that was inconsistent with classical physics. Quantum mechanics showed that the microscopic world is based on probability and uncertainty. While the classical world is deterministic and precise, the quantum world is filled with probabilities. This inconsistency presents one of the greatest challenges of quantum mechanics, and understanding the relationship between these two worlds is one of the primary goals of modern physics.

Quantum physics allows us to understand how nature operates at the subatomic level while presenting an intriguing relationship concerning how classical physics can yield results. The overlap between quantum physics and classical physics is a crucial topic for understanding how the adventures of the quantum world guide the classical world. In this process, quantum mechanics can, in some respects, be viewed as an "illusion"; however, this illusion concept is closely related to the quantum world's ability to explain the classical world.

Quantum physics is a theory that describes the behavior and interactions of subatomic particles. Among the fundamental principles of quantum mechanics are wave-particle duality, the uncertainty principle, and superposition. These principles suggest that subatomic particles can behave as both waves and particles, and it is impossible to precisely determine both position and momentum at the same time. Quantum superposition expresses that a particle can exist in multiple states simultaneously. However, to understand how classical physics results are attained, we must consider the effects of quantum physics on the macroscopic world. The rules of classical physics are generally the macroscopic limits of the quantum mechanical rules that apply at the subatomic level. Classical physics defines movements and forces with a certain degree of precision that are applicable to large-scale objects. However, these rules represent a limiting condition in which the fundamental principles of quantum mechanics are only valid to a limited extent, generally within a specific degree of precision and predictability.

While quantum mechanics explains the random and uncertain behaviors of subatomic particles, the results of classical physics assume that these uncertainties and quantum effects can often be neglected at the macroscopic level. The successful application of classical physics is made possible by the fact that quantum effects in large-scale systems become averaged results and deterministic behaviors. This reveals the complementary nature of quantum mechanics and classical physics. When quantum physics is evaluated as an illusion, this illusion is related to understanding how the macroscopic results emerging from quantum mechanical principles are reflected in the large-scale world. While quantum mechanics explains the fundamental operation of nature at the subatomic level, the rules of classical physics provide valid and predictable results in large-scale systems as a consequence of these fundamental principles. This represents a scientific understanding that bridges the gap between quantum mechanics and classical physics, helping us to comprehend nature's behavior at different scales.

Quantum physics is a branch of physics that explains how matter and energy behave at the most fundamental levels. This field, also known as quantum mechanics, encompasses many theories and principles. Here are some of the fundamental theories of quantum physics:

Wave-Particle Duality

Wave-particle duality is one of the most interesting and mysterious concepts in quantum physics. This concept suggests that light and matter can exhibit both wave and particle properties. This duality fundamentally challenged the old understanding that began with Newton's classical physics, which made a clear distinction between waves and particles. According to classical physics, something is either a wave or a particle; however, quantum physics has opened up questions about what this duality really means. This phenomenon first emerged in the 17th century when scientists such as Isaac Newton and Christiaan Huygens investigated the nature of light. Newton argued that light was composed of tiny particles, while Huygens proposed that light was a wave. Both views could be supported by specific experiments, but they were inadequate to fully explain the true nature of light. This debate gained a new dimension in the 19th century with Thomas Young's double-slit experiment. Young demonstrated that light creates interference patterns when passing through two slits, proving the wave nature of light. However, this did not completely exclude the particle nature of light.

Albert Einstein strongly supported the particle structure of light by suggesting that light is emitted in energy quanta, or photons, to explain the photoelectric effect. This demonstrated that light exhibits both wave and particle properties. In other words, light can behave like a wave, but it can also interact as a particle under certain conditions. Wave-particle duality is not limited to light; it also applies to matter particles such as electrons. Louis de Broglie proposed that every particle has a wavelength associated with it. This wavelength is inversely proportional to the mass and velocity of the particle. Experiments on electrons confirmed de Broglie's hypothesis; electrons could create interference patterns under certain conditions, thus behaving like waves. The most significant outcome of this duality in terms of quantum mechanics is related to Heisenberg's Uncertainty Principle, which states that a particle's position and momentum cannot be precisely known at the same time. The wave nature prevents a particle from being in a specific location, while the particle nature limits the wave character to a specific area. This duality symbolizes the departure from the deterministic world of classical physics and helps us understand the probability-based, uncertain structure of the quantum world.

Wave-particle duality forms the foundation of quantum mechanics and plays a key role in our understanding of the nature of the universe's microscopic structure. Photons, electrons, and other fundamental particles, exhibiting both wave and particle properties, explain many phenomena that cannot be accounted for by classical physics. Accepting this duality has also been a significant step in the development of modern technologies. Many innovations, such as semiconductors, lasers, and quantum computers, have become possible through the understanding brought by wave-particle duality. This duality not only inspires our understanding of the physical world but also raises philosophical and metaphysical questions. It leads us to question the fundamental nature of the

universe, how reality operates, and the role of observations. This concept, which transcends classical worldviews and opens the doors to deeper realities, continues to challenge the boundaries of science and thought.

Superposition

Superposition is one of the fundamental and at the same time most incomprehensible concepts of quantum mechanics. This concept expresses that a quantum system can superimpose multiple states simultaneously, meaning it can exist in multiple states at once. The principle of superposition is one of the key elements that shows how different the quantum world is from the deterministic nature of classical physics. In the classical physics world, an object is either here or there, either in this state or that state; however, in the quantum world, a particle can be both here and there at the same time, in this state and in that state simultaneously. This strange reality first emerged during the development of quantum mechanics in the 1920s. When Schrödinger's wave equation was used to describe the state of a particle, it demonstrated that the solutions of this equation are a mixture of different possible states of the particle. This mixture is referred to as superposition. For example, if we consider an electron's orbit around an atom, classical physics might say that the electron is in a specific orbit, while quantum mechanics states that this electron can be found in many different orbits at the same time. Each of these orbits creates a superposition of the probabilistic positions where the electron might be located.

One of the most famous examples of superposition is Schrödinger's Cat thought experiment. In this experiment, a cat is considered both dead and alive, depending on a mechanism triggered by the decay of a radioactive atom. The atom is in a state of superposition, meaning it is both decayed and not decayed at the same time. This situation also reflects on the cat; the cat is simultaneously both dead and alive. However, when an observation is made, the superposition collapses, and the cat is seen either dead or alive. This thought experiment emphasizes how strange and counterintuitive the nature of quantum superposition is. The principle of superposition plays a significant role not only as a theoretical concept but also in the development of modern technologies. Quantum computers rely on this principle. While classical computers work with bits, each bit defined as either 0 or 1, quantum computers work with quantum bits, or qubits. A qubit, due to the principle of superposition, can be both 0 and 1 at the same time. This ability allows quantum computers to process many different possibilities simultaneously, enabling them to possess computational power far beyond that of classical computers.

Superposition also bridges quantum physics with philosophical and metaphysical questions. What is the nature of reality? What is the true state of a system when it is not being observed? The principle of superposition raises such questions and prompts us to question our classical physics understanding. Quantum superposition suggests that the nature of reality is uncertain, probabilistic, and dependent on the observer. This concept challenges the deterministic perspective of the classical world. Superposition demonstrates that the fundamental structure of the universe is filled with probabilities and uncertainties, and that reality is a sea of probabilities that collapses with our observations. This phenomenon has revolutionized not only our understanding of the

physical world but also our understanding of human consciousness and the nature of the universe. Superposition persists as one of the most crucial elements of quantum mechanics, challenging the limits of science, expanding our thought landscape, and revealing the strange realities within the depths of the universe.

Schrödinger's Equation

Developed by Erwin Schrödinger in 1926, this equation describes the evolution of quantum systems over time. The Schrödinger equation calculates the wave function (ψ) of a particle, and this wave function provides the probability of the particle being found in a specific location. The Schrödinger equation is one of the cornerstones of quantum mechanics and defines the evolution of a quantum system over time. Developed by Austrian physicist Erwin Schrödinger in 1925, this equation has become one of the most important tools of quantum mechanics and is considered a central element of wave mechanics. The Schrödinger equation offers a completely different perspective from the deterministic nature of classical physics, allowing a particle or system to be described not by a precise location or momentum, but rather by a probability-based wave function.

The Schrödinger equation defines the wave function of a quantum system, that is, the state of the system. This wave function provides the probability of the system being in a certain state. The fundamental form of the equation is known as the time-dependent Schrödinger equation. The Schrödinger equation can be thought of as the quantum mechanical counterpart of Newton's laws in classical mechanics. However, unlike classical mechanics, the Schrödinger equation does not provide a deterministic solution. The Schrödinger equation is used in the analysis of many physical systems. Various systems, such as situations where a particle is trapped in a potential well, the energy levels of electrons in a hydrogen atom, and chemical bonds, can be modeled using this equation. Particularly, its application on the hydrogen atom has shown that the energy levels of electrons are quantized and can exist at specific energy levels. This result is considered a significant achievement in explaining the spectral lines of atoms.

The Schrödinger equation also enables a more advanced understanding of quantum mechanics. Many phenomena, such as the superposition of waves, the uncertainty principle, and quantum tunneling, can be explained using this equation. The principle of superposition indicates that wave functions can overlap, allowing a system to exist in multiple states simultaneously. The uncertainty principle states that the position and momentum of a particle cannot both be known with certainty at the same time; this is a natural consequence of the wave functions formulated by the Schrödinger equation. Quantum tunneling is the phenomenon where a particle can pass through a potential barrier that it could not cross according to classical physics rules, and the Schrödinger equation is used to explain this process.

The Schrödinger equation is a tool that helps us understand the foundations of the quantum world. By moving away from the certainties of classical physics, it demonstrates that the universe has a probabilistic structure at the microscopic level. The development of this equation has also played a critical role in understanding the impact of quantum physics on technological innovations in the

modern world. Many advanced technologies, such as semiconductors, lasers, and quantum computers, are built upon the predictions and solutions of the Schrödinger equation. The Schrödinger equation not only assists us in understanding the physical world but also encourages us to think deeply about the philosophical and metaphysical implications of quantum mechanics.

Uncertainty Principle

The Uncertainty Principle, as one of the most fundamental and striking principles of quantum mechanics, has fundamentally altered classical physics' views on the nature of the microscopic world. Formulated in 1927 by the German physicist Werner Heisenberg, this principle expresses that the position and momentum of a particle cannot be precisely known at the same time. In classical physics, the position and velocity of an object can be measured with the desired precision simultaneously; however, in the quantum world, the situation is entirely different. Heisenberg's Uncertainty Principle arises from the nature of measurement processes in the quantum realm. When we attempt to measure a particle's position with high precision, information related to its momentum inevitably becomes uncertain, and the opposite is also true. This situation is not due to the limitations of measurement devices but rather stems from the intrinsic properties of the quantum system.

The Uncertainty Principle is considered a fundamental fact that emphasizes the probabilistic nature of the quantum world. According to this principle, measuring physical quantities such as a particle's position and momentum causes a change in the system's wave function, which in turn affects the particle's state. Thus, the measurement process is an active action that influences the observed system. This situation highlights the critical role of measurement in quantum mechanics. Heisenberg's Uncertainty Principle also plays a key role in explaining some strange phenomena observed in the microscopic world. For instance, it shows that an electron does not move in a fixed orbit within an atom; rather, it exists within a probability cloud. This uncertainty means that electrons can be found in various locations with specific probabilities rather than being confined to a specific orbit. This fact is a fundamental element in understanding the structures of atoms and molecules.

The Uncertainty Principle also demonstrates that classical determinism does not hold in the quantum world. Classical physics argues that future events arise as a definite result of past events. However, in quantum mechanics, a system's future state cannot be predicted with certainty; only probabilistic predictions can be made. This reveals that the universe has an uncertain and probabilistic structure at the microscopic level. This principle holds significant importance not only in understanding the physical world but also in philosophical and metaphysical discussions. The Uncertainty Principle questions the deterministic understanding of the universe and opens the door to profound questions such as free will, consciousness, and the fundamental nature of the universe. The outcome of measurements is, in a sense, dependent on the observer, which prompts us to consider the role of the relationship between the observer and the observed system in quantum physics.

Heisenberg's Uncertainty Principle has also had a significant impact on the development of modern technologies. Quantum cryptography utilizes the uncertainty introduced by this principle to ensure the secure transmission of information. Furthermore, the influence of this principle can be felt in the fundamental operating principles of quantum computers. Unlike classical computers, quantum computers can process multiple probabilities simultaneously, a direct consequence of the uncertainty principle. The Uncertainty Principle continues to exist as a principle that challenges the boundaries of scientific thought, helping us understand the complexities and depths of quantum mechanics. This principle reveals that the fundamental structure of the universe is unpredictable, uncertain, and based on probabilities.

Quantum Entanglement

Quantum entanglement is one of the most surprising and profound concepts of quantum mechanics, demonstrating that the connection between particles goes beyond the rules of classical physics. This phenomenon refers to the situation in which the quantum states of two or more particles become so intertwined that, regardless of the distance between them, any measurement made on one particle instantaneously affects the states of the other particles. This situation, proposed by Albert Einstein, Boris Podolsky, and Nathan Rosen in 1935 and known as the "EPR paradox," was termed by Einstein as "spooky action at a distance," questioning the classical understanding of local realism. Entanglement arises when two particles, such as electrons, are associated with each other in a specific quantum state. Regardless of how far apart they are, when they are entangled, measuring the state of one immediately determines the state of the other. For example, if the spin states of two electrons are entangled, measuring the spin of one electron provides instantaneous information about the spin of the other electron. In this case, if it is found that one electron's spin is up, it is confirmed that the other electron's spin is down.

Quantum entanglement is a rather peculiar and difficult-to-understand phenomenon from the perspective of classical physics. Classical physics states that no interaction can occur faster than the speed of light, a result of Albert Einstein's theory of relativity. However, quantum entanglement suggests that a measurement on one particle can instantaneously affect the other entangled particle, no matter how far apart they are. This occurs without any classical signal transmission between the two particles, demonstrating how different quantum mechanics is from the classical world. This phenomenon has been further explored through Bell's theorem, developed by John Bell in 1964. Bell showed that local hidden variable theories are insufficient to explain quantum entanglement and that entanglement is indeed a phenomenon beyond classical understanding. The mathematical expressions known as Bell's inequalities are used to test the results of experiments involving entangled particles. These experiments have confirmed that quantum entanglement cannot be explained by classical physics.

Quantum entanglement plays a critical role in the development of modern technologies such as quantum computing and quantum communication. In quantum computers, entangled qubits provide speed and capacity far beyond classical computers by enabling parallel computations. In quantum communication, entanglement offers a revolutionary method for data security. Quantum

cryptography ensures the secure transmission of information using entangled particles. If a third party tries to eavesdrop on this communication, the entanglement is disrupted, and this interference is detected instantly.

From a philosophical and metaphysical perspective, quantum entanglement raises important questions about the fundamental nature of the universe. Entanglement challenges the concepts of local realism and causality, supporting the notion that the universe has a deeply interconnected structure beyond classical physics rules. Additionally, quantum entanglement re-evaluates the role of the observer. How observation instantaneously affects the states of entangled particles allows us to develop a deeper understanding of the relationship between the observer and the observed in quantum mechanics.

Quantum entanglement is considered one of the most striking discoveries of modern science, demonstrating how different quantum mechanics is from classical physics and shedding light on profound questions about the workings of the universe at the microscopic level. This concept has created a significant revolution in the scientific community, revealing the strange and counterintuitive nature of the quantum world and laying the foundation for scientific and technological advancements.

Copenhagen Interpretation

The Copenhagen Interpretation is one of the most widely developed theoretical frameworks for understanding the nature of quantum mechanics and the measurement problem. Proposed in the late 1920s by Niels Bohr and Werner Heisenberg, this interpretation offers a radical approach to making sense of the fundamental concepts and peculiarities of quantum mechanics. The Copenhagen Interpretation suggests that the quantum world has a probabilistic structure rather than a deterministic one, and that the state of a quantum system only achieves a definite outcome when a measurement is made. At the core of this interpretation is the concept of the wave function of quantum systems. The wave function defines the state of a system and the probability distribution related to that state. According to the Copenhagen Interpretation, the state of a quantum system exists in a superposition of possible states before a measurement is made. This means that, as illustrated by Schrödinger's famous cat thought experiment, a quantum system can exist in multiple states simultaneously. However, this superposition collapses when an observer makes a measurement, reducing the system to one of those probabilities. This indicates that quantum systems do not possess a definite reality; rather, they exist in a structure made up of probabilities.

The Copenhagen Interpretation highlights the fundamental difference between classical physics and quantum mechanics. While classical physics asserts that we can precisely determine the state of a system and predict how that state will change over time, the Copenhagen Interpretation expresses that in the quantum world, probabilities reign supreme rather than certainties. The future state of a quantum system can only be predicted within the framework of probabilities, and these predictions depend on the properties of the wave function.

Another important aspect of this interpretation is the role of the observer. According to the Copenhagen Interpretation, when an observer makes a measurement, the state of the system becomes defined. This illustrates the effect of measurement on quantum systems and how the observer shapes the reality of the system. Before observation, the state of the system is indeterminate, and with the observer's intervention, the system collapses into a specific state. This point raises questions about the relationship between observation and reality in quantum mechanics, leading to philosophical debates. The Copenhagen Interpretation is also closely related to the uncertainty principle, which forms the conceptual foundation of quantum mechanics. Heisenberg's uncertainty principle proposes that the position and momentum of a particle cannot both be known precisely at the same time. The Copenhagen Interpretation explains that this uncertainty is inherent in the nature of quantum systems and how measurement affects this uncertainty. That is, when a measurement is made, the reduction of the system to a specific state stems from this uncertainty.

Unlike other interpretations of quantum mechanics, the Copenhagen Interpretation argues that the reality of the quantum world consists solely of probabilities, and that these probabilities are transformed into certainties through observation. This approach acknowledges the strange nature of the quantum world and redefines the relationship between observation and reality based on the probabilistic structure that underlies quantum theory. Representing a departure from the deterministic nature of classical physics, this interpretation has been central to ongoing discussions about quantum mechanics and has created significant ripples in the scientific community. The Copenhagen Interpretation offers a powerful framework for understanding the non-intuitive features of quantum mechanics. However, this interpretation has also led to criticisms and the emergence of alternative views. For instance, Einstein rejected the probabilistic nature of quantum mechanics, famously stating that "God does not play dice," arguing that there must be a definite reality in the quantum world. Nevertheless, the widespread acceptance of the Copenhagen Interpretation has ensured its status as a crucial milestone in understanding the fundamental principles of quantum mechanics.

Many Worlds Interpretation

Proposed by Hugh Everett in 1957, the Many Worlds Interpretation posits that every quantum event creates parallel universes in which every possibility occurs. This interpretation allows for the explanation of superposition and probabilities without the need for classical collapse. As one of the most controversial and intriguing explanations of quantum mechanics, the Many Worlds Interpretation provides a radical perspective on the nature of the universe. In other words, this interpretation suggests that for every possibility in the quantum world, independent parallel universes or "worlds" are created. Unlike the Copenhagen Interpretation, which views the superposition of quantum states as collapsing into one probability upon measurement, the Many Worlds Interpretation asserts that each probability exists as a real universe.

According to the Many Worlds Interpretation, when a measurement is made on a quantum system, the wave function does not collapse; rather, each possible outcome creates a "world," and each of

these worlds exist independently of one another. For example, when we measure the spin of an electron, one world finds the electron's spin pointing up, while another world finds it pointing down. These worlds are completely separate and do not interfere with one another; however, each represents a different outcome of the quantum superposition. This suggests that our universe is a vast network of many worlds, where different possibilities are continuously branching out.

The Many Worlds Interpretation aims to address one of the fundamental problems of quantum mechanics: the measurement problem. In the Copenhagen Interpretation, when a measurement is made, the wave function collapses, and the system is reduced to a specific state. However, this process does not entirely align with classical physical laws and leaves many questions unanswered. The Many Worlds Interpretation, by asserting that the wave function always exists and never collapses, radically resolves this issue. Each measurement divides the universe into branches, each representing a separate universe where a different probability has occurred. Thus, the probabilistic structure of quantum mechanics becomes compatible with a deterministic understanding of the universe.

In Hugh Everett's "Many Worlds Hypothesis," it is stated: "Everything that is happening or can happen is happening in an infinite number of universes. Every time you make a decision, the universe splits; one universe is where you exist, while the other is where the alternative occurs. In a sense, the universe you are in can be called your individually created universe."

From a philosophical perspective, the Many Worlds Interpretation raises profound questions about the nature of reality. If every possibility indeed occurs in some world, how can we know which world we inhabit? Additionally, is it possible to transition between these worlds, or how can an individual's consciousness exist across these different worlds? Such questions demonstrate that the Many Worlds Interpretation extends beyond being merely a physical theory, providing a foundation for metaphysical discussions. This interpretation also has significant implications for concepts such as free will and fate. If every possibility occurs in a world, it means that each of us is living different lives by making different decisions in different worlds. In this case, the effect of free will and our choices determines not the path we will take in a particular universe but rather which universe we will exist in. This presents a radical perspective that requires us to rethink the concepts of fate and free will.

Quantum Tunneling

Quantum tunneling is one of the most intriguing and surprising phenomena of quantum mechanics. This process refers to the ability of a particle to pass through an energy barrier or obstacle that would be insurmountable according to classical physics rules. While classical physics requires that a particle's energy must exceed the height of a barrier, the situation is more complex in quantum mechanics. Quantum tunneling is one of the fundamental features of quantum mechanics, based on Heisenberg's Uncertainty Principle. According to this principle, a particle's position and momentum cannot be known precisely at the same time. This uncertainty affects the probability of a particle being able to overcome a barrier. From a classical physics perspective, this event seems unusual

and counterintuitive.

To explain how a particle can tunnel through a barrier, the Schrödinger equation is invoked. This equation describes the behavior of the particle and is used to solve the wave functions inside and around a barrier. In quantum mechanics, a particle's wave function can penetrate into a barrier, creating a probability of it passing through that barrier.

Quantum tunneling plays a critical role in modern electronic devices, particularly in semiconductors and transistors. In the operation of these devices, quantum tunneling events at a small scale can affect their performance. For example, in devices like MOSFETs (Metal-Oxide-Semiconductor Field-Effect Transistors), the tunneling phenomenon is considered in the design of smaller transistors. Quantum tunneling also plays an important role in the functioning of quantum computers. Quantum computers can perform calculations much faster than classical computers by using quantum bits (qubits). In these computations, quantum mechanical processes like tunneling contribute to the optimization of algorithms and computational power.

Additionally, quantum tunneling is involved in the nuclear fusion reactions occurring within stars. Stars produce energy through the fusion of atomic nuclei under conditions of high temperature and pressure. In this process, the effect of quantum tunneling that allows nuclei to overcome each other helps them to surpass the necessary energy barrier for fusion reactions to occur. Quantum tunneling can also influence the rates and mechanisms of chemical reactions. Particularly at low temperatures, tunneling effects can increase the likelihood of chemical reactions taking place and can accelerate some reactions.

Quantum Field Theory (QFT)

Quantum Field Theory (QFT) is one of the fundamental building blocks of modern physics and provides a framework that combines quantum mechanics with special relativity. This theory explains particles and their interactions through quantum fields defined at every point in spacetime. QFT is one of the most successful theories developed to understand the subatomic world, allowing us to comprehend how fundamental forces like electromagnetic, weak, and strong nuclear forces interact at the quantum level. In classical physics, particles are defined as point-like entities with specific mass and trajectories. However, quantum mechanics and relativity radically change this classical understanding. According to quantum mechanics, particles also exhibit wave characteristics and are described by probability distributions rather than having a precise trajectory. Special relativity posits that massive particles cannot move at the speed of light and that time can vary depending on the observer's speed.

In Quantum Field Theory, particles are treated as quantized excitations of fields. These excitations manifest as fundamental particles such as photons, electrons, and quarks. For instance, the quantized excitations of the electromagnetic field produce photons. Fields are regarded as a continuous structure present at every point in the universe, and fluctuations in these fields are observed as the presence of particles. Thus, particles are defined not as fixed entities but as dynamic states of fields. One of QFT's most significant achievements is the theory known as

quantum electrodynamics (QED), which describes the interactions of the electromagnetic force at the quantum level. QED provides extremely precise explanations of interactions between photons and charged particles, making predictions that align perfectly with experimental results. This theory not only helps us understand how quantum fields work but also represents a significant step in grasping the complexities of subatomic interactions.

Quantum Field Theory also lays the foundation for important discoveries, such as the Higgs mechanism and the existence of the Higgs boson. The Higgs mechanism is a process that explains how particles acquire mass, occurring through a special quantum field known as the Higgs field. The discovery of the Higgs boson in experiments conducted at CERN in 2012 further demonstrated the power and accuracy of QFT's predictions. Additionally, QFT forms the basis of the theory known as the Standard Model, which explains three fundamental forces of nature—electromagnetic, weak nuclear, and strong nuclear forces. The Standard Model presents a comprehensive theoretical framework that describes the universe's smallest building blocks and the interactions between these building blocks. This model includes fundamental particles like protons, neutrons, electrons, and neutrinos, as well as their smaller components, such as quarks and gluons. Based on the principles of Quantum Field Theory, the Standard Model has revolutionized our understanding of the workings of the universe at a microscopic level.

The depth of Quantum Field Theory also raises new questions about the nature of the universe. Topics such as how quantum fields interact with spacetime and how these interactions contribute to the large-scale structure of the universe are of great importance in physicists' research. While the unification of general relativity and QFT has not yet been fully achieved, it is believed that this union will be key to understanding the fundamental nature of the universe at its most basic level.

From a philosophical perspective, QFT radically alters the classical understanding of particles. It suggests that particles are not independent entities but rather dynamic states of fields. This indicates that the fundamental nature of the universe is built on continuous fields and their interactions, rather than fixed and discrete objects. This situation fundamentally changes our understanding of physical reality and provides a new perspective on the nature of the universe's most basic building blocks.

Standard Model

The Standard Model is a comprehensive theoretical framework that explains the smallest building blocks of the universe and the interactions between these building blocks, serving as one of the cornerstones of modern physics. Based on quantum field theory, the Standard Model describes the three fundamental forces in nature—the electromagnetic, weak nuclear, and strong nuclear forces—and how these forces interact with the particles that make up matter. This model is an extremely successful theory that allows us to understand physical reality at the microscopic level and is in excellent agreement with experimental data.

At the core of the Standard Model are two main types of particles: fermions and bosons. Fermions make up the building blocks of matter and are divided into two fundamental categories: quarks and

leptons. Quarks are the components of hadrons, such as protons and neutrons, and come in six varieties: up, down, charm, strange, top, and bottom quarks. Leptons include fundamental particles like electrons, muons, tau leptons, and neutrinos. Each quark and lepton has an antiparticle, indicating that every matter particle has a corresponding antimatter counterpart. Bosons, on the other hand, are force-carrying particles that mediate the interactions of the four fundamental forces. The electromagnetic force is mediated by photons; the weak nuclear force is mediated by W and Z bosons; and the strong nuclear force is carried by gluons. These three forces are central to the Standard Model, explaining how particles interact with one another. Gravity, or the force of attraction, is not explained within the Standard Model because this force has not been defined in a way that is compatible with quantum mechanics and falls outside the scope of this model.

The Standard Model is also associated with the Higgs mechanism and the existence of the Higgs boson. The Higgs mechanism is a process that explains how particles acquire mass, occurring through a special quantum field known as the Higgs field. The Higgs boson is the quantized excitation of this field, discovered through experiments conducted at CERN's Large Hadron Collider in 2012. The discovery of the Higgs boson has further proven the strength and accuracy of the predictions made by the Standard Model, providing significant support for this theory. The success of the Standard Model stems not only from the robustness of its theoretical framework but also from its experimental verifications. Numerous experiments conducted over the years have confirmed the existence of the particles and forces predicted by the Standard Model, demonstrating its effectiveness in understanding how nature operates at the microscopic level. For instance, it has been experimentally validated that the weak nuclear force is mediated by W and Z bosons, the strong nuclear force is carried by gluons, and the electromagnetic force interacts via photons. Additionally, the masses and mixings of neutrinos have also been explained in accordance with the predictions of the Standard Model. However, the Standard Model is not a complete theory in itself. The effects of gravity at the quantum level fall outside the scope of the Standard Model, necessitating its integration with general relativity to understand the universe's large-scale structure. Furthermore, cosmological phenomena such as dark matter and dark energy are also not explained by the Standard Model, prompting physicists to seek a more comprehensive theory that goes beyond it.

Despite its shortcomings, the Standard Model offers an extremely successful framework for understanding how nature operates at the most fundamental level. It occupies a central place in our current knowledge of particle physics and is the most comprehensive theory developed to explain the interactions of the smallest building blocks of the universe. This model plays a critical role not only in understanding physical reality at the microscopic level but also in elucidating the relationships between matter, energy, and forces.

String Theory

String theory is a revolutionary approach that has created significant buzz in the world of modern physics, proposing a new way to understand the fundamental nature of the universe. This theory suggests that the smallest building blocks of the universe are not point-like particles but rather

vibrating strings. These strings are one-dimensional and vibrate at different frequencies, determining the properties of all fundamental particles in the universe. One of the most striking features of string theory is its potential to unify all fundamental forces and particles. Consequently, string theory is often referred to as "the theory of everything."

In physics, the four fundamental forces—gravity, electromagnetism, and the strong and weak nuclear forces—are typically studied in separate frameworks. However, string theory aims to unify all of these forces within a single theoretical framework. The different vibrational modes of strings give rise to different particles; for instance, a string vibrating in a specific way can manifest as an electron, while another vibrational mode may produce a photon. These strings are thought to possess a vibrational scale on the order of the Planck length (approximately 10^{-35} meters), making them incredibly tiny.

String theory also stands out for its potential to resolve certain inconsistencies between classical physics and quantum mechanics. In particular, efforts to unify general relativity with quantum mechanics have gained new momentum with string theory. The theory incorporates the idea of a multi-dimensional universe; the vibration of strings necessitates the existence of dimensions beyond the three-dimensional space we perceive. These extra dimensions can exist only at very small scales and are therefore not directly observable. String theory posits that the universe has an 11-dimensional structure. Among these dimensions, 3 are the spatial dimensions we know (x, y, z), and one is known as the time dimension. The other 7 dimensions are curled up at a microscopic scale, which we cannot perceive. Similar to the Kaluza-Klein theory, these extra dimensions imply that our universe is not merely four-dimensional and predict the existence of higher dimensions. These higher dimensions are represented by complex geometric structures known as Calabi-Yau manifolds.

String theory requires a symmetry known as supersymmetry (SUSY) to understand how the universe operates. Supersymmetry proposes that for every fundamental particle, there exists a corresponding superpartner. These superpartners share similar properties with normal particles, such as mass and charge, but differ in their quantum characteristics like spin. For example, the superpartner of an electron is called a selectron, while the superpartner of a photon is known as a photino. Supersymmetry can help solve some problems within the Standard Model, particularly in maintaining the mass of the Higgs boson and addressing quantum mass issues. Furthermore, supersymmetry predicts the existence of a particle called the "neutralino," which is a natural candidate for dark matter.

String theory is considered one of the most promising approaches to describing quantum gravity. Traditional gravitational theory, known as general relativity, explains how spacetime behaves on a large scale, but inconsistencies arise at the quantum level, or very small scales. String theory has the potential to resolve these inconsistencies. The vibrational modes of strings include a particle known as the graviton, which is thought to carry the force of gravity. Therefore, string theory represents a significant step toward unifying both quantum mechanics and general relativity into a single framework, aspiring to become "the theory of everything."

String theory is also used to explain how the Big Bang occurred. According to string theory, the Big

Bang may have originated from a collision between branes, which are known as brane worlds. These branes may represent different universes, and a collision between these universes could lead to the release of energy and the formation of our universe. In recent years, string theory has been enriched by concepts such as the holographic principle and AdS/CFT (Anti-de Sitter/Conformal Field Theory) duality. The holographic principle suggests that the three-dimensional reality of our universe may actually be encoded on a two-dimensional surface, while AdS/CFT duality establishes a connection between string theory and quantum field theory.

Despite its many theoretical advantages, string theory is challenging to test experimentally. The sizes of strings are so small that it is impossible to observe them directly with current technologies. Additionally, string theory predicts the existence of a multitude of potential universes, which could weaken its predictive power. Some physicists argue that while string theory is mathematically beautiful, its relevance to physical reality remains uncertain.

CHAPTER 3

QUANTUM PHYSICS AND THE NATURE OF THE UNIVERSE

Beyond Time and Space

In classical physics, time and space are considered absolute and fixed concepts. However, quantum physics proposes that time and space may not be constant and that these concepts should be approached differently at the quantum level. The relativity of time begins with Einstein's general theory of relativity. In quantum mechanics, however, time is regarded not as a linear flow but as an uncertain probability. In quantum mechanics, even the chronological order of events may not be certain. In quantum entanglement, a change in one particle can instantaneously affect its entangled partner, implying an interaction that occurs faster than the speed of light. This indicates that the concept of time must be reconsidered at the quantum level.

In quantum physics, causality (the cause-and-effect relationship) is not linear. The boundaries between the past and the future become blurred. A measurement made in the future can influence events that seem to have occurred in the past. This is clearly evident in the phenomenon of quantum erasure. In quantum mechanics, particles do not exist in a specific space; they exist as probability waves. This invalidates the concept of absolute space found in classical physics. Quantum entanglement demonstrates that particles can interact with each other independently of space. This idea gives rise to the notion that space may merely be an illusion and that reality can be defined by an underlying quantum wave function.

Unity in the Universe

Muhyiddin Arabi's doctrine of Wahdat al-Wujud (Unity of Being) asserts that all existence

originates from a single source, and this source is unified. The parallels between this doctrine and quantum entanglement are striking. In quantum entanglement, once two particles interact, they remain connected regardless of the distance between them. This supports the idea that all beings in the universe may be interconnected and are, in fact, different manifestations of a single whole. The universe consists of the manifestations of the Truth.

Quantum entanglement gives rise to the idea that all particles in the universe could be entangled with one another, and this entanglement could create a universal unity. This supports not only a physical understanding of unity but also a spiritual one. Arabi's unity manifests at every level of existence; just like in quantum entanglement, this unity is present in every corner of the universe and creates connections among all particles. Quantum entanglement suggests that all beings in the universe are interconnected and that this bond is independent of time and space. Entanglement can be thought of as the physical reflection of this divine connection in the quantum world.

Universal Order and Chaos

In the quantum world, uncertainty and probability are the foundations of everything. This contrasts with the predictable world of classical physics. Quantum uncertainty should be seen as a reflection of the chaos underlying the order in the universe, regarded as the awe-inspiring order of the Absolute Will within chaos. Chaos theory states that small changes can lead to significant consequences. Similarly, quantum mechanics shows that uncertainties at the microscopic level can create unexpected effects in the macroscopic world. Quantum mechanics helps us understand how order emerges in the universe despite uncertainty.

The random movements of particles create specific probability distributions, and these distributions appear as organized structures in the macroscopic world. This concept also resonates in Islamic thought; the emergence of order from chaos signifies a reflection of Allah's will. Quantum mechanics explains this process at a physical level. In the quantum world, the boundary between order and chaos is very thin. A system can transition from an orderly state to a chaotic one with a small intervention. This demonstrates that the universe is in a constant state of balance and that this balance can change at any moment.

CHAPTER 4

QUANTUM PHYSICS, CONSCIOUSNESS, AND EXISTENCE

Human Will and Quantum Probabilities

In quantum mechanics, events are not deterministic (predetermined); instead, they are based on

probabilities. This uncertainty raises the question of whether human will is free. This uncertainty at the quantum level supports the idea that human will is free and that new decisions can be made at any moment. While classical physics argues that everything in the universe follows a specific chain of causality, quantum mechanics shows that this chain can be broken and that freedom can exist within uncertainty.

Human will can host many possibilities simultaneously, similar to a quantum superposition. The moment of decision is thought of as a transition from one of these possibilities to another. Will "collapses" one option, shaping reality as if making a measurement. This indicates that human will is not merely a physiological process, but also a universal quantum phenomenon. Will is important in the sense that it allows a person to make choices in accordance with Allah's will. Quantum mechanics explains how these choices are shaped by the convergence of probabilities. Allah's will underlies these probabilities, and human will continues to operate in accordance with this divine plan. Quantum uncertainty elucidates the role of free will in determining human destiny. Every choice means realizing a probability at the quantum level, contributing to the individual's ability to determine their own fate. "We have wrapped up the deeds (or fate) of every person around their neck... On the Day of Resurrection, we will bring forth to them a record that they will find spread open." (Isra/13) The word "wrap" here interestingly resembles the concept of entanglement.

The Quantum Nature of Existence: Quantum Being and Non-Being

In quantum mechanics, being and non-being are not absolute; a particle can simultaneously exist and not exist. This is expressed through concepts like quantum superposition and virtual particles. In the quantum world, the boundary between being and non-being is blurred. A particle only transitions to a definite state of existence when observed; this means that existence is a momentary fluctuation. This shows that existence in the universe is in a continuous flow and is not absolute.

Muhyiddin Arabi and other Sufi thinkers assert that existence is a continuous process of creation and is recreated at every moment. Quantum mechanics supports this thought on a physical level. Every quantum event demonstrates that the universe is recreated at every moment and that creation is a dynamic process. This dynamic nature of existence represents a point where quantum physics and Sufism converge, reinforcing the idea that the universe is in a constant state of divine creation. In the quantum world, whether a particle exists or not depends on its quantum state. This illustrates the thin line between being and non-being. A particle only exists under certain conditions, and these conditions can change at any moment. Spiritually, this implies that a person's existence is also a continuously changing process and that they are in a constant state of divine recreation. Existence gains meaning within this continuous change and renewal.

Consciousness Building the World

The relationship between humans and the world has intrigued many thinkers and scientists throughout history. From ancient philosophers to modern scientists, the questions "What is

reality?” and “Do we perceive the world, or does the world shape our consciousness?” have always been debated. Especially with the advancement of quantum physics, these questions have gained a new dimension.

Quantum physics places the observer's role at a central position, opening up discussions on consciousness's effect on reality. The observer effect in quantum mechanics suggests that the state of a particular system is uncertain until an observation is made, at which point the state becomes definite. This situation is symbolized by one of quantum physics' most famous thought experiments: Schrödinger's Cat. The cat is both dead and alive until observed. This idea supports the notion that human consciousness can shape the world through observation. Neuroscience proposes that human consciousness is merely a phenomenon generated by the brain. Studies on how our brains process perceptions and construct the external world demonstrate that consciousness is entirely based on biological processes. However, this does not mean that consciousness has no effect on the world. Our perceptions influence how we interpret reality, which in turn indirectly determines how we experience the world.

From a philosophical standpoint, Immanuel Kant's view of “Transcendental Idealism” argues that the human mind plays an active role in understanding and interpreting the external world. According to Kant, the mind categorizes experiences, and without these categories, the world would be an incomprehensible chaos. This view takes the constructive role of consciousness a step further. A more contemporary theory, “Orchestrated Objective Reduction (Orch-OR)” theory, posits that consciousness is closely related to quantum processes. Developed by Roger Penrose and Stuart Hameroff, this theory argues that consciousness is built from quantum-level processes, and therefore, consciousness can directly influence physical reality. Ultimately, our consciousness is a factor that directly affects how we perceive and experience the world, demonstrating that consciousness plays a decisive role in the construction of reality.

Consciousness and Quantum Superposition

Penrose-Hameroff's Orchestrated Objective Reduction (Orch-OR) Theory represents a radical quantum mechanics-based approach to the nature of consciousness. This theory suggests that conscious experiences cannot be explained by classical physics laws and instead are connected to quantum mechanical processes, particularly the collapse of quantum superpositions. Roger Penrose, a renowned mathematician and physicist, argues that consciousness cannot arise from classical computational processes, asserting that quantum mechanical processes play a critical role in consciousness. According to Penrose, conscious experiences emerge from the spontaneous collapse of quantum superposition states. This process is referred to as objective reduction (Objective Reduction, OR), and this reduction occurs based on a fundamental geometric structure in the universe.

Stuart Hameroff, as an anesthesiologist and neuroscientist, has provided a neurobiological framework for Penrose's quantum consciousness theory. Hameroff suggests that the brain possesses suitable environments in which intracellular structures called microtubules can maintain

quantum superposition states. Microtubules are significant components of the cytoskeleton, and according to Hameroff, the quantum processes within these structures can be associated with Penrose's proposed objective reduction process. These two scientists propose that consciousness is directly linked to processes occurring at the quantum level in the brain and that these processes operate independently of classical neural activity.

The Orch-OR theory posits that conscious experiences arise when quantum superposition states in microtubules reach a certain threshold. This collapse is based on Penrose's objective reduction process and is connected to the fundamental geometric structure of the universe. The reduction of quantum superposition allows conscious experiences to emerge instantaneously. According to the theory, this process is organized as part of the brain's neural activity and forms the source of conscious thought, perception, and emotions. Penrose argues that conscious thought is different from classical algorithmic processes, drawing on mathematical principles such as Gödel's incompleteness theorem. Hameroff presents the idea that the biological structures of the brain can host quantum processes.

Quantum Entanglement and Consciousness: Mental Connections

Quantum entanglement describes a state where two or more particles interact instantaneously with each other. This concept can metaphorically be used to explain phenomena such as interconsciousness connection or telepathic connections. The idea of interconsciousness entanglement suggests that the consciousness of different individuals may somehow be connected, and the state of one may influence the other. This attempts to establish a scientific basis for telepathy or other psychic phenomena.

Quantum entanglement supports the idea that the entire universe is interconnected. In this context, it can be concluded that consciousness is also part of this universal entanglement. The concept of universal consciousness implies that all consciousnesses are connected as parts of a whole. This theory argues that individual consciousness is an expression of a universal consciousness and that through entanglement, it is somehow connected to every corner of the universe. This also serves as a spiritual expression of unity and connection.

Consciousness, Quantum Time, and Free Will

Quantum mechanics suggests that time is not a linear and absolute concept. The flexibility of time at the quantum level leads us to rethink the relationship between consciousness and time. Does consciousness have the potential not only to perceive the past and the present but also to determine the future? The understanding of quantum time opens up speculations about consciousness's capacity to influence the future.

In quantum mechanics, the exact state of a system is determined by observation. This raises new questions about free will and decision-making processes. Can consciousness truly make choices

freely by taking advantage of uncertainty at the quantum level? This opens a philosophical discussion about how consciousness interacts with quantum mechanics and the role of free will within universal processes. The relationship between quantum time and free will is also crucial for understanding the dynamics between consciousness and fate. Consciousness may access a level of existence beyond time, which demonstrates how an individual's will is connected to universal processes. This contributes to the redefinition of consciousness's place in the universe and its relationship with universal reality.

Quantum Consciousness and Spiritual Enlightenment

Quantum mechanics can also be viewed as a process through which consciousness can expand and reach higher levels. The expansion of consciousness enables individuals to attain a deeper understanding of reality and awareness of universal consciousness. This is also connected to processes of mystical enlightenment and spiritual development. Quantum consciousness can help individuals align more deeply with the universe and recognize universal reality. Spiritual awakening is often defined as the individual's grasp of themselves and the universe with a deeper understanding. Quantum consciousness may play an important role in this awakening process. Interactions of consciousness at the quantum level allow individuals to experience universal consciousness. This process enables the individual to connect not only with the physical world but also with metaphysical realities. Spiritual awakening deepens further with the expansion of consciousness at the quantum level. Quantum consciousness supports the idea that consciousness is a universal phenomenon and that all beings are part of this consciousness. This means that consciousness is a fundamental component of the universe and exists within a universal integrity. This understanding enables individuals to perceive themselves as part of the universe and to contribute to this integrity. Spiritually, this means that individuals live in harmony with the universe and embrace universal consciousness. It allows for the realization of a monotheistic approach in conjunction with a Sufi perspective.

CHAPTER 5

QUANTUM PHYSICS AND COSMIC WISDOM

Quantum and Mystical Uncertainty

In quantum physics, the Heisenberg Uncertainty Principle states that we cannot know both the position and momentum of a particle precisely at the same time. This indicates that there is no absolute certainty in the quantum world and that everything exists within uncertainty. This principle of uncertainty shakes the classical understanding of physics and reveals that the universe has a more complex and unpredictable structure. Similarly, in Sufi teachings, there is an emphasis

on uncertainty. In the face of Allah's absolute knowledge, the limitations of human knowledge and understanding are experienced as uncertainty. This is an experience that deepens a person's submission and trust in Allah. The workings of the universe and the manifestation of fate occur at a level beyond human intellect, and this uncertainty subjects humans to Allah's will. The connection between quantum uncertainty and mystical uncertainty lies in the acknowledgment by both realms of the impossibility of reaching absolute knowledge. Both quantum physics and Sufism view uncertainty as a fundamental quality of the universe and existence, and this uncertainty requires deeper wisdom and surrender.

Quantum Entanglement and Universal Connection

Quantum entanglement is a phenomenon where two or more particles are interconnected in such a way that the state of one instantly affects the state of the other, regardless of the distance between them. This supports the idea that everything in the universe is interconnected. Entanglement transcends classical physics, demonstrating that the universe can be conceived as a whole and that each particle has a deep connection with others. In Sufi teachings, the concept of "Unity of Being" (Vahdet-i Vücut) expresses the oneness of all beings and their existence as a manifestation of Allah. This view emphasizes that everything in the universe is a reflection of Allah and, therefore, interconnected. In Sufism, it is believed that everything in the universe is part of a whole, and each being is a manifestation of Allah. The parallel between quantum entanglement and the Sufi understanding of unity lies in the idea that everything is interconnected and that things that appear to be separate actually exist in deep unity. This helps us to understand the connectivity and unity in the universe in both scientific and mystical terms. It can be summarized as the infinity of THE ONE.

Quantum Superposition and Mystical Multiple Realities

Quantum superposition refers to the ability of a particle to exist in multiple states simultaneously. A particle can exist in numerous possible states until it is observed. This is a concept that challenges the classical understanding of a single reality. Superposition demonstrates that the universe accommodates multiple possibilities, and these possibilities "collapse" upon observation. In Sufism, it is thought that the universe possesses multiple realities at different levels. On the spiritual journey, different levels of consciousness and layers of truth are discovered. Each level represents a different reality, and these realities are intertwined. In Sufism, everything in the world has both apparent (zahirî) and hidden (batinî) meanings, and these meanings are explored at different levels of consciousness. The levels of the self (nefs) are known through lessons of unity (tevhid), and each level is perceived as different layers of consciousness. On the other hand, the connection between quantum superposition and mystical multiple realities lies in the acceptance of multiple states of reality by both fields. While quantum physics suggests that a particle can exist in many states at once, Sufism argues that the universe has multiple and profound layers of meaning.

Quantum Time and Spiritual Time

In quantum physics, time is not a linear and absolute concept as understood in classical terms. Time exhibits flexibility at the quantum level, and particles appear to be able to move backward in time. This suggests that time might be an illusion at the quantum level and that the past, present, and future can coexist simultaneously. In Sufi teachings, time is viewed as a creation of Allah and is not linear in a spiritual sense. In the divine plan, the past, present, and future are seen as a whole. Time, within Allah's absolute knowledge, is a singular moment, a concept that transcends human perception. This spiritual interpretation of time expresses that humans can transcend the temporal constraints of worldly life and that everything is predetermined in harmony as part of the divine plan. The connection between quantum time and mystical time lies in the idea that time is not an absolute and linear concept. Both approaches accept that time has a more flexible and complex structure and can be conceived within a universal integrity.

CHAPTER 6

QUANTUM PHYSICS AND METAPHYSICS:

THE NATURE OF REALITY

Quantum Mechanics and the Understanding of Reality

One of the most common interpretations of quantum physics, the Copenhagen Interpretation, raises important questions about the nature of reality. According to this interpretation, quantum systems do not exist in a definite state until they are observed; they exist as a superposition of possibilities. The act of observation collapses this superposition, bringing the system into a specific state. This approach suggests that reality is dependent on the observer and that the universe does not possess an objective reality, but rather takes shape based on our observations. Quantum mechanics implies that reality may have a subjective nature. If the state of a quantum system is defined by observation, then the observer plays an active role in the formation of reality. This challenges the classical physics understanding of objective and independent reality. The observer is not only a witness to events in the universe but also a creative element. This interpretation of quantum mechanics raises profound questions about the role of human consciousness in the formation of the universe. Is human consciousness merely an element that observes reality, or is it an active participant in its shaping?

Multiple Universes and Parallel Realities

The idea that everything existing in the universe is not merely a single reality, but rather that

countless different universes may exist, is addressed by the theory of multiple universes. This theory posits that there are multiple universes and that the universe we know is just a small part of this vast ocean of universes. Each universe may have its own unique physical laws, different initial conditions, and narrative structures. This idea occupies an important place in modern physics theories. The uncertainty and probabilistic nature of quantum mechanics has fueled thoughts about the existence of multiple universes.

In quantum mechanics, the states of particles gain certainty when observed. However, when unobserved, these particles are thought to exist in different probabilistic states. Each of these probabilities may manifest as reality in another universe. For example, if an electron has the possibility of being in two different orbits, it may be in one orbit in one universe and in the other orbit in another universe. This can be termed as parallel universes or realities. When each infinite possibility combines with events occurring in different universes, a vast landscape of multiple universes emerges. Another approach that supports this theory is the cosmological multiverse theory. Beyond our expanding universe after the Big Bang, there may be other universes that are similarly expanding and possess their own distinct physical realities. In this model, where our universe is defined as a "bubble," it is thought that an infinite number of bubble universes exist, each independently manifesting existence. In some universes, time may flow at a completely different pace, while in others, the laws of physics could be far beyond what we know.

Parallel realities can also be considered a subset of the theory of multiple universes. According to this view, each universe contains alternative versions of the reality we know. Decisions, choices, and probabilities in human life may manifest differently in these universes. Each possibility that results from a decision may exist in a different parallel universe. This thought opens the door for humans to question concepts of fate and free will from a different perspective. Each choice could be the starting point of a different universe, revealing an infinite web of realities. Multiple universes and parallel realities influence not only scientific thought but also philosophical and metaphysical ideas. These theories provide a profound perspective on concepts such as the nature of reality, human existence, and the flow of time. Although the existence of multiple universes has yet to be proven, these ideas challenge the limits of modern physics and allow us to ask entirely new questions about the nature of the universe. At the same time, the idea that every possibility somehow occurs in a universe prompts humans to reconsider their place and meaning in the cosmos.

Quantum Thought Experiments and Metaphysical Questions

Schrödinger's Cat thought experiment addresses the quantum superposition state in which a cat can be both dead and alive. The cat exists in both states simultaneously until observed. This experiment was designed to question the logical implications of quantum mechanics. It raises profound philosophical questions about the nature of reality and how consciousness affects this reality. The Zeno Paradox is an ancient philosophical question that inquires whether motion is an illusion. In quantum mechanics, such paradoxes intersect with modern questions about the motion of particles and the nature of time. Quantum mechanics requires us to rethink the nature of time

and motion to resolve these paradoxes. This gives rise to metaphysical questions about whether time is continuous or discontinuous.

Quantum thought experiments open metaphysical discussions about how consciousness shapes reality. Quantum systems that are in an uncertain state until observed emphasize the role of consciousness in creating reality. This leads to the idea that consciousness may not only be a perceiving entity but also a shaper of existence. Metaphysically, this situation prompts inquiry into how human consciousness functions as part of universal consciousness.

Quantum Physics, Metaphysics, and the Meaning of Existence

Quantum mechanics raises new questions about the meaning of existence. If the universe takes shape based on the conscious state of the observer, it questions whether existence has an objective meaning. The metaphysical meaning of existence can be interpreted in various ways, depending on the individual's conscious state and how this state interacts with universal reality. Quantum physics suggests that the universe must be understood as a whole, with everything interconnected. This understanding of wholeness emphasizes that existence should be understood not as individual parts but as a unified entity. Metaphysically, this supports the idea of the unity of existence and that individuals are inseparable parts of this unity. This presents a new perspective on the meaning of existence, combining both scientific and spiritual understandings.

Being and Non-Being, Continuous and Infinite Creation

The nature of reality, viewed from the perspective of quantum systems, can be likened to a binary code formed by 1s and 0s; being and non-being dance within a cosmic rhythm. In the digital world, 1 represents a state of being, an existence, while 0 symbolizes a non-being, an annihilation. This binary logic reflects a fundamental concept of quantum physics, which shows that existence is not fixed, but rather, constantly oscillates between being and non-being within the superposition of probabilities. Let's consider the concept of a quantum bit or qubit; this is the building block of quantum computation, challenging the classical bit system. A classical bit is either 1 or 0, but a qubit can represent both 1 and 0 simultaneously and can represent an infinite number of states. This phenomenon is not just a mathematical abstraction, but a reflection of the fundamental nature of reality. In this quantum realm, being (1) and non-being (0) are not opposites but are intertwined; they create a continuity that blurs the boundaries between being and non-being.

This concept resonates deeply with the metaphysical understanding of existence in various spiritual traditions, particularly in Islamic mysticism (Sufism). The universe is seen as an expression of divine will. The logic of 1 and 0 can be viewed as a metaphor for continuous creation and annihilation that defines existence. In this view, every moment of existence is a discrete event that arises from non-being and returns to it, reshaping only to be reborn. In Islam, Allah's system is defined as continuous creation, and the universe is recreated at every moment. This concept is consistent with the idea of a universe composed of small, indivisible units of time and space in

quantum physics. Each unit is a moment of creation; it is a binary choice between being and non-being, an expression of divine will. The concepts of continuous being and non-being in quantum physics demonstrate that reality is not a static existence, but a dynamic process. Just as quantum particles appear and disappear in a state of flux, the universe itself is in a state of continuous creation and annihilation. This is not a random process, but one governed by the fundamental principles of quantum mechanics, ultimately reflecting divine order.

In this sense, the logic of 1 and 0 serves as a metaphor for being and non-being, as well as for the divine system that governs the universe. As in quantum systems, the boundary between being and non-being is fluid and dynamic; similarly, the boundary between existence and non-existence in the universe is also so. Every moment brings a new creation, a new manifestation of divine will, a new binary choice in the cosmic dance between being and non-being. As a result, this discovery of quantum systems and the logic of 1 and 0 leads us to a deeper understanding of the nature of reality.

CHAPTER 7

QUANTUM PHYSICS AND DAILY LIFE:

The Effects of Scientific Revolution on Human Behavior

Decision-Making Processes

The uncertainty principle of quantum mechanics goes beyond the notion of certainty in classical physics. This uncertainty also plays a role in decision-making processes. How do our decisions shape when faced with uncertain situations? In daily life, how can we leverage quantum mechanical principles to cope with uncertainty and assess risks? This involves exploring ways to make effective decisions under uncertainty. Quantum superposition and probabilities create a process similar to individuals evaluating different options simultaneously. This means that a person can make conscious choices by considering various possibilities. This approach encourages developing a broader perspective in personal decision-making processes and taking different scenarios into account. Quantum mechanics emphasizes the role of conscious choices. Individuals have the potential to shape reality by making conscious choices in their decision-making processes.

Human Behaviors

Quantum entanglement refers to a state in which particles interact with each other instantaneously. How might this concept play a role in social interactions and human relationships? It is thought that emotional and mental bonds between people can be explained using metaphors of entanglement.

This can help us gain a deeper understanding of the connections and interactions between individuals. Quantum consciousness plays a significant role in individuals' interactions with their social environment. It is important to examine how conscious experiences and emotional states shape social interactions. Quantum thinking may assist individuals in making their social connections and interactions more conscious and meaningful. On the other hand, quantum communication refers to the fast and effective exchange of information. This could also be effective in enhancing empathy and emotional connections. Empathy can benefit from quantum communication concepts to understand the emotional and mental states of other individuals and establish a deep bond with them.

Worldview

The fundamental principles of quantum mechanics could reshape our current understanding of the nature of the universe. Quantum physics can help us understand how the universe functions as a whole and how reality is formed. This understanding may influence how individuals perceive the universe and their place within it. The new perspectives that quantum physics adds to our worldview could change our philosophy of life. Quantum physics may also affect our spiritual understandings. The quantum nature of the universe could prompt us to reevaluate our spiritual and mystical quests. Quantum consciousness can offer new avenues for individuals seeking deeper connections and understandings in a spiritual sense. Moreover, quantum physics may influence social change processes. It is important to understand how scientific revolutions alter societal norms and values. Quantum thinking can be used to restructure social structures and human relationships. This could contribute to the development of individuals and societies in harmony with universal consciousness.

Personal Development

Quantum mindset offers new approaches in personal development and growth processes. The expansion of consciousness at the quantum level can serve as a foundation for personal transformation and development. This includes exploring how individuals can use quantum thinking methods to better understand themselves and realize their potential. Quantum methods can be effective in personal transformation processes. These methods are used to support individuals' inner changes and development. Quantum meditation, thought techniques, and other methods can assist individuals in expanding their consciousness and achieving their personal goals. Quantum physics presents new approaches to enhance quality of life. This can help individuals make their lives more satisfying and meaningful. Ultimately, quantum thinking could contribute to individuals leading healthier, more balanced, and happier lives.

CHAPTER 8

THE CONSERVATION OF ENERGY AND QUANTUM TELEPORTATION

The Conservation of Energy and the Consciousness of Worship

The conservation of energy is a fundamental law in the physical world that states that the total energy within a system remains constant over time. This principle means that energy can neither be created nor destroyed; it can only be transformed from one form to another. For example, when a car engine burns fuel, chemical energy is converted into mechanical energy for the operation of the engine and the movement of the car. In this process, energy is not lost; it merely takes on a different form. Energy is one of the fundamental building blocks of the universe, and this principle of conservation is a universal law applicable to every event in nature.

In Sufism, however, the concepts of existence and non-existence carry deep metaphysical meanings. Existence is considered in terms of God's existence and the existence of created beings, while non-existence is understood as the absolute lack of independent existence beyond God's presence. In Sufi thought, the belief that everything actually gains "existence" over "non-existence" — that is, every being inherently contains a void — is widespread. This aligns with the idea that all created beings are temporary and dependent in the face of God's absolute existence.

The connection between the law of conservation of energy and the existence-non-existence relationship in Sufism points to the essential unity of matter and energy. Energy, like existence, can never be completely destroyed; it simply transitions from one state to another. In Sufism, the notion that everything inherently consists of non-existence and that only the existence of God is absolute can be likened to this process of energy transformation. The conservation of energy illustrates that everything in the material world is in a constant state of change and transformation, but a fundamental reality (energy) underlying these changes never disappears. In the Sufi perspective, this fundamental reality is the existence of God, and everything's return to Him forms the foundation of Sufism's understanding of existence and non-existence.

The law of conservation of energy also sheds light on the cycle of creation and annihilation in Sufism. According to Sufi teachings, beings come from God and ultimately return to Him. This cycle symbolizes the transition of beings from one state to another, similar to the transformation of energy from one form to another. During these transformations, just as energy does not vanish, beings also do not cease to exist; they simply continue their existence in a different form. The Sufi concept of "Wahdat al-Wujud" (Unity of Being) asserts that all beings essentially share a single reality, which is God. Similarly, the conservation of energy conveys that the fundamental reality underlying all physical processes does not change; it only appears different in form. Viewed from this perspective, it is possible to establish a profound parallel between the conservation of energy and the concepts of existence and non-existence in Sufism. Both imply an essence of invariability and continuity while simultaneously encompassing a process of transformation and re-creation. This transformation manifests itself in both the ever-changing nature of energy in the physical world and the return of beings to God in the metaphysical world. The deep teachings of Sufism

reveal that the invariability reflected by the law of conservation of energy permeates everything in the universe and can also be seen as a reflection of God's absolute existence.

Quantum Teleportation

Quantum teleportation is one of the most striking and intriguing phenomena in quantum mechanics and has the potential to revolutionize quantum information technologies. Quantum teleportation refers to the transfer of a particle or information from one place to another without physically transporting it, essentially "teleporting" it. This process relies on a quantum connection phenomenon known as quantum entanglement. Quantum entanglement means that two or more particles exhibit correlated behaviors regardless of the distance between them. Thus, the state of one particle can be instantaneously communicated to the other entangled particles.

Quantum teleportation fundamentally consists of three stages: first, quantum entanglement is established. This means that two particles within a quantum system become entangled with each other. In the second stage, the state of the particle to be transmitted is connected to the state of an entangled particle through measurement. This process requires the transmission of the state information as classical data. In the third stage, the information is reconstructed on the receiving end with the help of the entangled particles, meaning the state of the particle is reconstituted.

The applications of quantum teleportation are particularly significant in quantum computers and quantum communication systems. In quantum computers, quantum teleportation can be used to efficiently transfer and process information particles (qubits). Furthermore, in quantum communication systems, this phenomenon has potential in processes like quantum key distribution and data transmission to ensure secure information transfer. However, quantum teleportation is still in the experimental phase, and there are various challenges to practical applications. One of the most significant challenges is the creation and preservation of entangled particles. Additionally, the necessity of classical communication channels in information transmission limits the performance of quantum teleportation.

So far, one of the most successful quantum teleportation experiments was conducted in 2015 by Chinese scientists. In this experiment, researchers from Changchun University in China successfully carried out the quantum teleportation process over a distance of 100 kilometers. This experiment is one of the first significant successes demonstrating that quantum teleportation can be effectively applied over long distances. During the experiment, quantum information was transmitted from one location to another using quantum entanglement. In this process, the quantum teleportation was successfully completed through the complex interactions between quantum entanglement and classical communication. This experiment is considered an important step for the practical applications of quantum communication. Previous experiments had achieved successful quantum teleportation over shorter distances or smaller scales, but such experiments were typically conducted in laboratory settings and were distance-limited. The experiment in China represents a promising example for broader-scale and long-distance applications of quantum teleportation.

CHAPTER 9

QUANTUM MECHANICS AND THE STRUCTURE OF THE UNIVERSE:Cosmological Perspectives

Quantum Cosmology and the Big Bang

Quantum cosmology is a field that addresses theories about the origins of the universe from the perspective of quantum mechanics. It attempts to combine general relativity, which is used to explain the large-scale structure and nature of the universe, with quantum mechanics, which describes physical events at the micro level. Merging these two significant theories is a critical step toward understanding the universe's earliest moments. The Big Bang Theory is a cosmological model that suggests the universe began expanding from an extremely hot and dense point about 13.8 billion years ago. This theory provides a broad understanding of the universe's origins, evolutionary development, and current state. According to the theory, initially, the universe was compressed into a single point containing all matter and energy. The explosion that occurred at this point led to the universe starting to expand and cool down. However, explaining the initial moments of this expansion requires going beyond the laws of classical physics. This is where quantum cosmology comes into play.

The Big Bang Theory is one of the cornerstones of modern cosmology and is supported by various observations, including the expansion of the universe, cosmic microwave background radiation, and the abundance of elements. The expansion of the universe was discovered through observations made by Edwin Hubble in the 1920s, showing that galaxies are moving away from each other and that the universe is expanding over time. Cosmic microwave background radiation is a form of radiation that represents the residual heat from the Big Bang. Discovered by Arno Penzias and Robert Wilson in 1965, this radiation confirms how much the universe cooled down after the initial explosion and that it continued to expand. The abundance of elements, particularly hydrogen and helium, formed through nuclear fusion in the early universe, aligns with what the Big Bang Theory predicts.

Another area where the theory provides a comprehensive explanation is the evolution of the universe and its structural formations. The Big Bang Theory explains how galaxies, stars, and other cosmic structures formed and developed during the universe's expansion process. It also considers more complex factors such as the effects of dark matter and dark energy. In the early stages of the Big Bang, the universe was a system compressed to a very small scale and influenced by quantum mechanics. In this phase, classical physics laws were not applicable, and quantum fluctuations shaped the universe's structure. Quantum fluctuations are temporary energy fluctuations that occur in a vacuum. These fluctuations are based on Heisenberg's Uncertainty Principle, which is a fundamental principle of quantum mechanics that states the position and momentum of a particle cannot be known precisely at the same time. Therefore, these uncertainties led to random and temporary changes in energy density during the universe's earliest moments.

One of the main objectives of quantum cosmology is to explain that the Big Bang could be not just a starting point but a result of quantum processes. According to some theories, the beginning of the universe might have emerged as a result of a quantum fluctuation. These fluctuations may have triggered the initial seeds of the universe through small energy oscillations, initiating its expansion. Quantum fluctuations could have played a critical role in the initial formation of spacetime. In the early moments of the universe, these fluctuations determined the density distributions of matter, subsequently influencing the formation of galaxies and stars. This offers an important clue for understanding the structural differences of the present universe and the distribution of galaxies.

Another intriguing idea proposed by quantum cosmology is that the universe could be just one bubble within a "multiverse." Quantum fluctuations may have led to the formation of different universes in various regions. These universes might have their own laws of physics and initial conditions. This theory suggests that the Big Bang was merely the beginning of our universe but that other universes could exist within a much larger quantum landscape. As quantum cosmology seeks to answer profound questions about the origins of the universe, it offers exciting new perspectives at the intersection of quantum mechanics and cosmology.

Quantum Collapse

Quantum collapse refers to the process by which a quantum system transitions to a specific state at the moment of measurement. The expansion of the universe can be considered in relation to quantum collapse. Understanding the effects of quantum collapse on the expansion of the universe reveals how cosmological processes relate to quantum mechanics.

Quantum collapse is a process that describes the transition of a wave function in quantum mechanics to a specific state. Quantum collapse expresses the phenomenon where a particle "collapses" from a superposition state, which contains multiple possibilities, into a single definite state when observed. This process brings forth the measurement problem, one of the most mysterious aspects of quantum mechanics. Quantum collapse resolves the uncertainty regarding which state a particle is in and determines a single definite state. This highlights the significance of the observer's role in the quantum world. However, the questions of how and why collapse occurs remain unresolved, making this a central topic of discussion in quantum physics.

Black Holes

Black holes are among the densest regions of the universe and are crucial for understanding the relationship between quantum mechanics and general relativity. Quantum mechanics helps investigate the internal structure of black holes and how they store information. Understanding how black holes interact with quantum mechanics is important for explaining the structure of the universe and the role of black holes. Black holes represent one of the most challenging and fascinating topics related to quantum field theory and quantum collapse. A black hole is a region of space where the mass is so dense that it creates a gravitational field from which nothing, not even

light, can escape. According to classical general relativity theory, a black hole contains a singularity at its center, a point of infinite density with zero volume. However, quantum mechanics complicates this concept. Quantum field theory attempts to examine the fields surrounding black holes and how these fields behave. At this point, it becomes evident that black holes are complex structures that need to be understood through both quantum mechanics and general relativity theories.

Hawking Radiation

Hawking Radiation is an important discovery in understanding how black holes relate to quantum field theory. Stephen Hawking proposed, using quantum field theory, that black holes are not entirely black and can emit radiation across their event horizons. This radiation arises from quantum fluctuations. A black hole consumes one of the virtual particle-antiparticle pairs occurring in a vacuum while the other escapes as radiation. This leads to black holes losing mass and eventually evaporating over time. Hawking Radiation emerges at the intersection of quantum mechanics and black holes and raises profound questions about the thermodynamic properties of black holes.

The information paradox in black holes is also related to quantum collapse and field theory. According to quantum mechanics, information cannot be destroyed; however, the Hawking Radiation emitted from the matter contained within black holes could lead to information loss. This contradiction highlights the inconsistency between quantum mechanics and general relativity. The question of how information is preserved in black holes is one of the most challenging questions in modern physics research, and the resolution of this paradox could lead to broader theories, such as quantum gravity.

The relationship between quantum field theory, quantum collapse, and black holes is crucial for understanding the fundamental nature of the universe. These three concepts come together to illuminate how physical reality behaves at both microscopic and macroscopic levels. The integration of two major theories—quantum mechanics and general relativity—could lead to the development of a more comprehensive theory that explains the fundamental workings of the universe in the future. Therefore, these concepts continue to be a significant research area for scientists striving to push the boundaries of modern physics and unravel the mysteries of the universe.

Dark Matter

Dark matter is a type of matter that makes up a large part of the universe, interacting neither with light nor with electromagnetic forces but being effective through gravity. Although the nature of dark matter is not fully understood, observations in the universe strongly support the existence and effects of this component. Dark matter plays an important role in explaining the movements of galaxies and galaxy clusters. The rotation curves of galaxies appear to contain much more mass than can be explained by the visible matter present in their centers and surroundings, indicating

the presence of dark matter.

Dark matter also plays an effective role in the movements of stars and other celestial bodies, as well as in the formation of large-scale structures such as galaxy clusters and cosmic structures. The large structures in the universe have been shaped and pulled by the gravity of dark matter. These effects have been detected through indirect observations, such as the irregularities seen in cosmic microwave background radiation and the dynamics of galaxy clusters. Dark matter is generally defined as a type of matter that does not interact with light and is not visible in any region of the electromagnetic spectrum. Therefore, direct observations are difficult, and its existence is typically detected through indirect methods. Various theories have been developed to understand the structure and nature of dark matter, including theoretical particles like WIMPs (Weakly Interacting Massive Particles) and axions.

Dark Energy

Dark energy is a mysterious component that accelerates the expansion of the universe and constitutes a significant portion of the universe's total energy. Observations of supernovae in the late 1990s revealed that the expansion of the universe is accelerating, possibly influenced by dark energy. This finding suggests the existence of an unknown force affecting the cosmic expansion rate.

Although the nature of dark energy is still not fully understood, various theoretical models have been proposed. These include the cosmological constant defined in Einstein's general relativity, quantum vacuum energy, and dynamic forms of dark energy, such as quintessence. The cosmological constant is considered a constant related to vacuum energy and is described as a force that accelerates the expansion of the universe. Quantum vacuum energy is a form of energy that exists even in a vacuum and may play a role in affecting the universe's expansion. Quintessence describes dark energy as a form of energy that changes over time and could influence the rate of expansion of the universe.

It is estimated that dark energy constitutes about 68% of the universe. This proportion indicates that a large part of the universe's total energy is made up of dark energy, significantly affecting the dynamics of the universe's expansion. Observations and theoretical studies on the nature of this energy form have been conducted using various methods, including cosmic microwave background radiation, effects on galaxy clusters, and supernova data. Understanding the nature of dark energy is critical for expanding our knowledge about the fate and structure of the universe. Scientists are engaged in ongoing research and observations to better model the universe's expansion rate and structure, aiming to gain a clearer understanding of this mysterious form of energy.

Fundamental Components of the Universe

The components of the universe include physical, cosmological, and energetic elements, which

constitute the structure and dynamics of the universe. Here are the fundamental components of the universe:

Matter: Composed of atoms and molecules that make up the visible part of the universe, including stars, planets, asteroids, and other celestial bodies. Matter demonstrates physical existence through its atoms and molecules.

Dark Matter: A type of matter whose existence is understood indirectly from observations; it does not interact with light but is effective through gravity. It is hypothesized to explain the movements of galaxies and galaxy clusters.

Dark Energy: A form of energy that explains the accelerating expansion of the universe. Dark energy is considered a force that constitutes a significant part of the universe and leads to the acceleration of expansion.

Light: Electromagnetic waves, including photons, visible light, radio waves, microwaves, and other components of the electromagnetic spectrum, constitute light. Light plays a fundamental role in understanding many physical processes in the universe.

Space-Time: A concept that expresses the four-dimensional structure of the universe, consisting of three spatial dimensions and one temporal dimension. Space-time provides a framework for the interaction of matter and energy.

Celestial Bodies: Stars, planets, satellites, asteroids, comets, and other celestial objects constitute the physical structure of the universe. These exist in larger structures like galaxies and galaxy clusters.

Galaxies and Galaxy Clusters: Galaxies are defined as large structures containing stars, gas, dust clouds, and other celestial objects. Galaxy clusters are larger structures where these galaxies come together, forming the large-scale structure of the universe.

Quantum Fields: Fields defined within the framework of quantum mechanics that explain the existence and interactions of particles. Examples include electromagnetic fields and fields associated with strong and weak nuclear forces.

Proportional Distribution of the Universe's Components

The proportional distribution of the components of the universe approximately follows the current values determined through cosmological research and observations:

Dark Energy: Constitutes about 68% of the universe. Dark energy is a mysterious form of energy that accelerates the expansion of the universe and is a component that encompasses the majority of it.

Dark Matter: Makes up about 27% of the universe. Dark matter is a type of matter that does not interact with light but is effective through gravity, influencing the movements of galaxies and galaxy

clusters.

Visible Matter (Baryonic Matter): Comprises about 5% of the universe. This refers to matter that interacts with light and can be directly observed, including stars, planets, galaxies, and other observable materials.

Quantum Fields and Other Forms of Energy: These components are generally included within the above three main components or do not have a specific proportional distribution, as quantum fields and other forms of energy are considered in calculating the total energy of the universe and typically interact with other components.

These ratios have been determined based on observations and analyses of cosmic microwave background radiation, galaxy motions, and large-scale structures. The ratios of these components of the universe are further detailed through ongoing research in cosmology and astrophysics.

CHAPTER 10

QUANTUM TUNNELING AND BIOLOGY

Quantum tunneling is one of the most intriguing and surprising phenomena in quantum mechanics. This phenomenon occurs when a particle is able to pass through an energy barrier that it should not be able to overcome according to classical physics. In the quantum world, a particle's wave function has a probability of extending beyond an energy barrier, allowing the particle to "tunnel" through it. This phenomenon typically occurs at the subatomic level and plays a significant role in the functioning of biological processes. Recent research has shown that quantum tunneling contributes to vital functions in certain biological systems.

Photosynthesis, the process by which plants and some bacteria convert sunlight into energy, is one area where quantum tunneling plays a crucial role. During photosynthesis, light energy is absorbed by pigment molecules located in the chloroplasts of plant cells. This energy is then transferred to the energy transport system via electrons. What's fascinating is that quantum tunneling comes into play during this energy transfer. The energy is transported along the most efficient path thanks to quantum superposition and quantum coherence. This allows electrons to tunnel between energy levels and select the path of least energy, making the process of photosynthesis remarkably efficient. Quantum tunneling ensures that this energy transfer happens quickly and effectively.

Another interesting area of quantum biology is the relationship between DNA replication, mutations, and quantum tunneling. DNA is a molecule with a double-helix structure that carries genetic information, and its accurate replication is vital for the survival of living organisms. However, quantum tunneling can also be observed during proton transfer in the base pairs of DNA. Protons can move between base pairs, sometimes through tunneling. These quantum tunneling

events may lead to errors during DNA replication, resulting in mutations. Such quantum effects in DNA could contribute to the processes underlying biological evolution and genetic diversity.

Additionally, quantum tunneling is believed to play an important role in the functioning of enzymes. Enzymes are catalysts that speed up biological reactions, many of which involve energy-demanding processes such as the breaking or forming of chemical bonds. In some cases, quantum tunneling enables these chemical bonds to break at lower energy levels, thus accelerating biological reactions. Through quantum tunneling, enzymes can facilitate reactions with lower energy barriers, increasing the efficiency of biological processes. This is seen as one of the mysteries behind the rapid biochemical reactions.

Quantum tunneling opens a new window into the microscopic workings of biology. This phenomenon demonstrates that quantum physics plays critical roles not only in the subatomic world but also within living systems. From energy transfer in photosynthesis to mutation processes in DNA, quantum tunneling may have far-reaching effects in various areas of biology. This suggests that biological processes are far more complex than can be explained by ordinary chemical reactions and that quantum mechanics is necessary to explain some of these processes.

CHAPTER 11

QUANTUM MECHANICS AND OTHER SCIENTIFIC THEORIES: Interactions and Interpretations

Relativity Theories

Special relativity explains the behavior of objects moving at speeds close to the speed of light. The interaction between quantum mechanics and special relativity is a crucial topic in modern physics. The compatibility between special relativity and quantum mechanics plays a critical role in understanding how particles and energy flows operate. This relationship has led to the development of theories such as "quantum electrodynamics." General relativity, which explains the force of gravity and large-scale cosmological structures, has also spurred the exploration of theories like "quantum gravity." The harmony between general relativity and quantum mechanics is key to understanding cosmological phenomena such as black holes and the Big Bang. The merging of these two theories has paved the way for new ideas like "Grand Unified Theories" and "string theory."

Thermodynamics

Quantum thermodynamics studies the interaction between quantum mechanics and thermodynamics. This field explores how concepts such as energy transfer and entropy function from a quantum mechanical perspective. Quantum thermodynamics is used to understand the flow

of energy and information on microscopic scales and is closely related to classical thermodynamics.

Quantum information theory examines the quantum mechanical processes related to information processing and data transfer. The relationship between these processes and thermodynamics is important for understanding their effects on information entropy and the efficiency of information processing. The connection between quantum information theory and thermodynamics investigates how information processing and energy consumption can be optimized from a quantum mechanical perspective.

Standard Model

The Standard Model explains the interactions between fundamental forces and particles in particle physics. Quantum mechanics forms the mathematical and physical foundation of this model. Quantum mechanics plays a critical role in understanding the behavior and interactions of particles within the Standard Model. The Higgs field is defined as a field that gives particles their mass. Quantum mechanics is a key tool for understanding the processes through which the Higgs field grants mass to particles. The Higgs boson is the experimental confirmation of this mechanism and reveals the interactions between quantum mechanics and the Standard Model.

Other Scientific Fields

Quantum mechanics plays an important role in understanding chemical reactions and molecular structures. Chemistry benefits from the mathematical and theoretical principles of quantum mechanics. Quantum chemistry allows for the analysis of molecular structures and chemical bonds from a quantum mechanical perspective.

Quantum mechanics also plays a significant role in biological processes and molecular biology. The quantum mechanical understanding of biological processes such as DNA replication, photosynthesis, and enzyme reactions is important. Quantum biology investigates how biological systems function through quantum mechanical processes and applies this knowledge to biotechnology.

Quantum mechanics is critical in understanding cosmological events and the large-scale structure of the universe. The cosmic microwave background and quantum cosmology are examples of these interactions. The relationship between quantum mechanics and cosmology deepens our understanding of the formation and evolution of the universe.

CHAPTER 12

WARP FACTOR - THE WARPING OF SPACE AND TIME

The warp factor is a concept related to the bending of space-time, commonly found in science fiction literature, particularly in fictional systems where spaceships can travel faster than the speed of light. This concept is especially popular in science fiction series like Star Trek, where it is used to describe a technology that allows spaceships to cross intergalactic distances in a short amount of time. In theoretical physics and cosmology, the warp factor is associated with the concept of the bending and stretching of space-time. This idea is based on Albert Einstein's theory of general relativity, which suggests that gravity is related to the curvature of space-time. The warp factor presents a scenario where this curvature could be used to increase the speed of spaceships or objects.

The warp factor is typically described as a "warp field," a region where space-time is expanded and contracted in a controlled manner. This field creates a bubble around a spaceship, enabling the ship to move within this bubble. The bubble allows for the expansion and contraction of space-time, which in turn lets the ship travel at extremely high speeds without breaking the speed of light. This concept is based on several theoretical assumptions that rely on mathematical models and physical principles, with the most well-known model being the "Alcubierre drive" proposed by physicist Miguel Alcubierre. The Alcubierre drive envisions a spaceship moving inside a warp bubble where space-time is stretched and compressed. This theory suggests that such a spaceship could surpass the speed of light, though there are many scientific uncertainties and practical challenges about whether such technology could be realized in the real world.

The warping of space is one of the deepest and most mysterious features of the universe. General relativity posits that the warping of space is a result of the influence of mass and energy on space-time. This theory, introduced by Albert Einstein in 1915, states that mass not only exerts a gravitational force but also bends and shapes the fabric of space-time. To better understand this concept, we can imagine space as a flexible fabric. If a heavy object, like a ball, is placed on this fabric, it creates a dent underneath. This dent represents the warping of space-time. Large objects like stars or planets create such curvatures in space, and this curvature is what causes other objects to move around these massive bodies. The movement of planets around the Sun, for example, is a direct result of this warping of space. The planets try to move in straight lines, but since they travel through warped space, they follow circular or elliptical orbits instead.

The warping of space is not limited to massive objects alone—even light is affected by this bending. The phenomenon where light is bent by gravity is known as "gravitational lensing." A massive galaxy or galaxy cluster can bend the light coming from behind it, causing the light to reach Earth from a different path. This effect can cause objects in the distant universe to appear in locations different from where they actually are. The warping of space is also relevant to extreme objects like black holes. Around a black hole, space is so curved that it becomes impossible to escape. The event horizon of a black hole represents one of the most extreme examples of the warping of space. Nothing, not even light, can escape once it crosses this boundary. This property makes black holes some of the most mysterious and difficult objects to study in the universe.

The expansion of the universe is also linked to the warping of space. As the universe expands, the

fabric of space-time stretches, causing distant galaxies to rapidly move away from us. This movement is an indicator of the large-scale structure of the universe and its overall curvature. Whether the universe is flat, open, or closed is a question that stems from this curvature and will ultimately determine the universe's fate. The warping of space also implies the warping of time. According to the theory of general relativity, time slows down in the presence of strong gravitational fields. Near a massive object, time flows more slowly, revealing the relative nature of time. As one approaches a black hole, time appears to almost stop. Though time warping is a frequent theme in science fiction, it is, in fact, a fundamental reality of our universe.

CHAPTER 13: QUANTUM TIME

The Wheeler-DeWitt Equation

The Wheeler-DeWitt equation is a crucial element in the foundation of quantum gravity theory. Developed by John Wheeler and Bryce DeWitt in the 1960s, this equation seeks to unify general relativity with quantum mechanics. In classical physics, time is viewed as a parameter that organizes the sequence of events. However, the Wheeler-DeWitt equation questions this classical role of time and opens a discussion on whether time exists as a physical quantity. The equation describes the quantum state of the universe, and one of its remarkable features is the absence of a time parameter. This leads to the concept of "timelessness," suggesting that time plays no role in defining the quantum state of the universe. This notion of timelessness provides a new perspective on understanding cosmological events such as the origin of the universe and the Big Bang.

The nature of time in the context of the Wheeler-DeWitt equation can be interpreted in various ways. Some interpretations suggest that time is merely a classical illusion and does not exist in the fundamental structure of the universe. Others propose that time is a concept derived from the relationships between the quantum states of the universe. These differing interpretations raise profound questions about whether time truly exists and, if so, what kind of existence it has. While the Wheeler-DeWitt equation raises deep questions about the nature of time, it remains a key equation that calls for further research into quantum gravity and the fundamental structure of the universe. By suggesting that the universe can be defined in a timeless way, it forces us to reconsider the relationship between physical reality and time.

The Past and Future as Merely a Record

In quantum theory, time is replaced by the concept of the "moment." The past and future are merely records and are relative. For instance, when one is in distress, time seems to move slowly, while during pleasant moments, time appears to pass quickly. In this sense, life is merely a form of expression, interpretation, and perception. What we perceive and interpret according to the

software in our minds appears real to us in a dimensional sense, much like how events experienced in a dream seem real within the context of the dream world.

Timelessness and Spacelessness

Time not only works in a linear, forward direction but can also function in reverse. All future and past moments exist within the present. Quantum physics explains this scientifically. We are often told that past events shape the present moment. But what can be said about the idea that the future also shapes the present? In fact, contrary to common belief, the conscious transfer of information in the quantum dimension is not unidirectional but bidirectional. Both the past and the future (all times) shape the present moment. For example, the pain of the past and the anxiety of the future create depression in the present. While this may seem strange, the seeds of the past have been sown, and those of the future are also being sown with each passing moment. Thus, the present moment shapes the future, just as past seeds shape today. But do we know that current understanding and awareness also affect what we call the past?

Dual Nature of Matter (Both-And Theory)

The dual nature of matter, being both a particle and a wave, makes it difficult for the human mind, programmed to perceive through cause and effect, to grasp. Within the laws of the material world, humans generally find it easier to judge based on what they see. As we have previously mentioned, while cause and effect relations apply in the material world, holism governs the subatomic realm. Although these two realities may seem contradictory to us, they are not contradictory at all in these two dimensions. God's laws apply everywhere and at all times. We call this the "Both-And Theory." In a sense, we live in different dimensions simultaneously. Depending on our levels of awareness, we can perceive this. Everything in the universe has occurred within a single moment. Within the present moment, all moments exist potentially. In the sea of possibilities, every moment offers a new chance, and every observation breathes new life into being.

Time Travel

Just as present evaluations affect the future, they also influence the past. Future evaluations, in turn, shape the present. This interaction is bidirectional. So, does the present shape the past and future, or do the past and future shape the present? Both are true. Moreover, we cannot speak of one as the initial cause because the concept of priority and succession in time is also relative. The writing is written, and the pen has dried. Life is merely a process of observation. Our role is to live and evaluate the present moment. To the extent that we can do justice to the present moment, the past and future will be shaped accordingly. The human brain is programmed to think in terms of cause and effect. This is also compatible with the brain's system of working when it comes to planning, setting goals, and execution.

Ultimately, the extent to which we do justice to the present moment brings balance to all points in time. This creates a process of balancing and healing the whole, which we might call the butterfly effect. Even concepts we think of as individual are ascribed to the whole by universal intelligence. Collective prayers are a beautiful example of this. Even lifting a single stone affects the structure of the entire universe. No mistake or small act of kindness should be underestimated in this regard.

Quantum Space and Time

In quantum physics, the slower particles move, the more rapidly they spread out. Conversely, as the space they occupy contracts, their movement accelerates. At the speed of light, however, everything freezes, meaning time itself halts. In this state, the concepts of past and future lose their meaning, leaving only a single moment. At the quantum level, there is neither time nor space. Creation and destruction occur in a single instant and are already complete. The universe only exists as it is perceived, gaining existence through individual acts of observation.

All knowledge within the universe is present at every moment and in every place. Experiments show that, in holographic plates, it is not the image of the object that is recorded but the frequencies that form it. In this plane, time and space do not exist, which is why information is present everywhere and at every moment. Human perceptions are bound by the flow of time, giving them the illusion of living within it. However, in reality, humans live in the "moment." Most people do not realize this and live by imagining time in terms of the past or future. Yet, the true essence is the "moment." Every person has their own reality, and this individuality is constantly interacting with the universe.

In the quantum system, it is not time but the concept of the "moment" that matters. In other words, there is no continuous time. Every event occurs within a moment and transforms into another event in the next moment. "Reality" only applies to that specific moment. There is no continuous and absolute reality. Each being has its own unique time and reality. This notion is also proven by the theory of relativity. Thus, every entity has its own reality, and it is impossible to speak of a universal reality that is the same for everyone. In Sufi terms, truth is singular, but realities exist within the boundaries of perception.

The Relationship Between Time/Moment and Space in Sufism

In Sufism, the mystic experiences a state of complete annihilation. At this point, the distinctions between mind-body and subject-object disappear. Through the state of complete contemplation, one transcends beyond the three-dimensional space and time. Instead of a linear progression of moments, an eternal, timeless, and dynamic "now" is experienced. The spiritual realm does not consist of separate divisions of past, present, and future; rather, truth is experienced in the present moment.

Space is curved at different degrees, and time flows at varying speeds in different regions of the

universe. To reach the truth, one must first pass through and then transcend these limitations. At this point, existence itself becomes the greatest cause for gratitude. The state of gratitude requires happiness and peace. A Sufi is one who knows the value of the moment, who exists in the happiness, peace, and gratitude of the present moment, and gives the moment its due. The continuity of this state brings about a Sufi way of life.

The moment contains all that we define as time—past, future, and the present we perceive. Allah exists in the "moment." We, on the other hand, are bound by the concept of time. The reason we cannot know the future is that our perception of time does not encompass it. Allah's command "Be" was given in the moment. However, for us, the formation of the universe equates to an incredibly long span of time. In other words, the moment is a point. When this point is extended, it forms an infinite line. If a circle is drawn using a point on this line as the center, the diameter of the circle can be called time.

Verses Related to Time

The Quran contains many verses related to time. While quantum physics addresses topics such as the nature of time and its relationship to the universe, the Quran generally focuses on human moral and spiritual development and the unity and power of Allah. However, some verses can inspire thought about the nature and perception of time and may be seen as compatible with modern scientific theories like quantum physics. For example, "A day with your Lord is like a thousand years of what you count." (Hajj 47) This verse expresses that time is created by Allah and is under His control, emphasizing that time is a relative concept beyond human perception, which aligns with the flexibility of time in quantum physics.

"Indeed, a day with Allah is like a thousand years of what you count." (Rum 54) This verse also points to the relative nature of time and invites contemplation of how humans perceive it. In quantum physics, time is similarly understood as relative and subject to change depending on the movement of the observer. Such verses suggest that time exists outside human perception and align with modern scientific theories like quantum physics.

CHAPTER 14: HOLOGRAM AND QUANTUM

The Smallest Interacting Particle

Quantum refers to the smallest particle that interacts. In the "subatomic world," we encounter concepts that push the limits of human understanding and initially require significant effort to grasp, leaving us in awe at first. While Newtonian physics governs the macro world, in the subatomic realm, these physical laws lose their validity. At this level, the findings of quantum

physics come into play, and the concept of reality can be approached very differently. There is no solid structure at the subatomic level. The deeper we go, certainty gives way to emptiness, energy oscillation, mobility, and uncertainty.

One of the most intriguing aspects of the subject is that these subatomic particles sometimes behave as particles and sometimes as waves. The inner structure of atoms has a dual appearance and possesses an uncertain nature. So how is it that a tangible, solid world and universe (seemingly distinct from one another) can emerge from abstract units of energy? This is where our brain comes into play. Through its lens-like perception—by focusing on a particular feature or dimension from a bundle of infinite possibilities—it creates the three-dimensional world.

Holographic Principles

In reality, we move within the same system together with the infinite, boundless universe. Moreover, we exist within a finely connected holistic structure. The universe and all its structures have been created based on holographic principles. Therefore:

I. We are all parts of a single, indivisible whole, the One Totality.

II. All entities and structures that accompany creation are subject to the same law and possess the knowledge of the universe, the total structure.

III. All knowledge is present everywhere at all times.

IV. The structure we call the universe only comes to life through individual perceptions. For this to happen, both the observed and the observer are needed (the dualistic world/Realm of Witnessing).

Quantum physics reveals that there are no solid, isolated units of structure in the universe; at its core lies a vast ocean of energy. The positions of electrons cannot be definitively determined; they are in constant transformation and motion, interacting and communicating with one another.

Reality or Illusion?

The Theory of Relativity clearly states that time, space, and the three dimensions we perceive are not the only real structure. Freud, on the other hand, explains that our consciously labeled behaviors are actually an illusion and that our will is managed by subconscious factors in the background. As we can see, the realities we currently perceive as correct or absolute truth are, in fact, entirely illusions and delusions. One of the most critical issues is the debate over how free we truly are. One of the purposes of our existence is to understand, comprehend, and direct our actions in line with this awareness. As humanity grasps this understanding of wholeness, both the world we live in and interpersonal and international relations will inevitably improve, and all potential problems will be resolved before becoming chronic.

Transformation and Quantum Reflections

Transformation is present at all times and in all places. It is ever-changing in new manifestations. Matter transforms into energy, and energy into matter. Due to the limitations of our perception tools, we perceive this sea of energy as matter. According to quantum physics, matter cannot be destroyed, only changes form. This means that everything we see or do not see, including humans, is composed of forms of energy. And this structure is perceived as matter only through the brain and within the limits of perception. This is the reality of life. Everything in the universe consists of the transfer of energy and information. All structures in the cosmos vibrate, interact, and communicate. Similar attracts similar. Understanding one cell, one particle, is the most crucial aid in reaching the whole. These facts have now become more understandable with quantum physics and philosophy. A human being is a small model of the universe, equipped with the capacity to reveal universal knowledge.

Each entity possesses the knowledge of the entire universe. On the subatomic level, it is in communication with other entities that share a similar frequency or "Esma" (names of Allah/Esmaül Hüsna), either consciously or unconsciously, without the limitations of space and time. According to the quantum theory of parallel universes, entities in multiple dimensions simultaneously affect one another. Therefore, during the process of creating new choices and realities with our thoughts, we also influence other entities in the universe, both those we perceive and those we do not. According to quantum theory, particles only gain meaning when they are observed and imbued with significance by an observer. The dimension in which we live is built upon dualities. In this world of duality, any object directly takes shape based on the comprehension and perception of the observer, transforming into a new form. At this point, it is crucial to be mindful of the meanings we attribute to various situations.

CHAPTER 15 MULTI-LAYERED STRUCTURE: HUMAN

Infinite Possibilities and Universes

How can the existence of universes within universes in infinite possibilities be perceived? If we are swimming in an ocean of infinite waves, why wouldn't there be infinite life forms and parallel lives with endless choices and alternatives in this ocean of consciousness? The fact that knowledge and consciousness know no bounds and do not require the concept of space disrupts the idea of limitation from the outset. Thus, the notions of infinite universes and parallel lives seem not only reasonable but justified. Different perceptions of consciousness in dreams also provide significant evidence. In our book *The Dream Door*, we explored this topic comprehensively. All realms, described as different, coexist simultaneously in terms of time and space. They only gain existence according to changes in the means and frequencies of perception. In fact, the dream realm's resemblance to a state of death is the strongest evidence for this.

Multi-Layered Structure: Human

The concepts of "outer" and "inner" express different aspects of the same phenomenon, yet they essentially convey the same thing. We may say they are different expressions of the same thing. However, we evaluate them as distinct in a perceptual sense. Thus, it would not be wrong to say this: whatever is external affects what is internal, and likewise, the internal affects the external. The magnificent creation known as human, which holds different realms on every page, is the most beautiful work to be read—a magnificent book of the universe. On the other hand, the universe, particularly humanity, is in a constant state of transformation and change moment by moment. What exists does not cease to exist, nor does what does not exist come into existence. This is the case even now.

From the perspective of the mind and knowledge, it is possible to generate ideas in line with this by even evaluating the multi-layered structure of humans. The thought that what we call "baseless sorrow" or "baseless joy" could stem from which parallel structure or universe is incredibly exciting. Above all, humans cannot be isolated from their surroundings. Everything is in communication. We could say that everything interacts with the entire universe through some kind of energy network. This concept of a collective consciousness field is extremely important in terms of awareness of unity and togetherness. In the quantum world, it is impossible to isolate or separate particles from their environment. Interaction and information transfer continue at every moment. Even the so-called "empty" spaces connect the entire subatomic universe like a network. When an electron within an atom transitions from one energy level to another, it experiences all possible orbits before settling into the orbit most suitable to its energy. We can think of the electron as a particle, but we must also accept it as a fluctuating field. According to many Sufi evaluations, all the discussions of a three-dimensional world perceived by the five senses open doors to multidimensional reality.

Frequency Analyzer: The Brain

Our brain is our greatest miracle. There are approximately 90 billion neurons (nerve cells) in the human brain. The left side of the brain contains 200 million more neurons than the right side. The size of neurons in our brain ranges from 4 to 100 microns (one-thousandth of a millimeter).

The human brain generates a significant amount of energy. A sleeping brain can power a 25-watt light bulb.

Our brain, which serves as our natural hard drive, can store between 1,000 and 2.5 million music concerts. The reason for this broad range is that some people are much more adept in this area. Additionally, some scientists claim that the human brain can store an infinite amount of information.

The axons, which transmit nerve signals in the human brain, are 160,000 kilometers long. That is

long enough to circle the Earth four times.

Data travels at different speeds in the brain, depending on the type of neuron. The speed of thought in the brain ranges from 1.6 km/h to 432 km/h.

The human brain can scan and process complex images. Interestingly, a published study shows that processing complex images takes only 13 milliseconds.

Information belonging to the whole is recorded in DNA. All past experiences influence brain chemistry and are carried as electrical signals to the cells.

Thought is considered the highest form of energy, vibrating at the highest levels and frequencies. The mind, in the form of quantum vibrations, is energy-loaded potential, choosing its reality from among infinite alternatives and possibilities, striving to bring it into the material dimension. According to the holographic principle, the information of everyone and everything is intertwined and interconnected. Since all our feelings, thoughts, and intentions are energy waves emitted from us, everything affects everything else. Through this, when we stabilize our internal energy, we can gain the power to direct the body's vibration in the desired direction.

Quantum Consciousness and Inter-Neuronal Communication

At first glance, the brain seems to be made up of nerve cells (neurons) connected by signals carried by electrical currents. These neurons are made up of atoms. At the quantum level, however, we find that it is composed only of wavelengths and patterns of information. Thus, as our perspective deepens, so does the depth of our perception. At this point, it is not the physical brain of flesh that produces consciousness in humans but the connection between brain functions and levels of consciousness. In other words, it is possible to speak of a consciousness and intelligence at the quantum level. The connections between brain cells and what we intend and realize, as well as what we experience, are processed in wave form in the quantum void, holographically. Understanding the brain plays a key role in clarifying many issues. Life is not external but within our own worlds, in our own brains, our own perceptions, and our thoughts. We exist and gain existence through our thoughts.

The universe is built on mutual interaction and communication. One of the most important features of humans is the ability to increase and strengthen the connections between complex neurons. This can be achieved through inquiry, thinking, questioning, researching, examining, comparing, and evaluating. Each thought and inquiry leads to the further development and evolution of the hologram-structured brain. This is something everyone can work on and improve. When asked about his own brain, which is considered one of the most advanced, Einstein said he was not a special person but someone who showed deep patience with trial and error, constantly struggled, thought continuously, and found new questions. He eventually received answers to many of his questions. This is known as an organ that communicates and interacts with itself, i.e., talks to itself. The most important organ that enables this may be the brain itself. In this regard, Neuroanatomist Marian Diamond of the University of California conducted studies on Einstein's brain, revealing

that:

The number of connections between neurons in Einstein's brain was much higher than in other people.

These connections were formed by Einstein asking himself questions and using his imagination.

Increasing the number of connections between neurons is within everyone's control.

Every person is the architect of their own brain. The essence is to learn how to learn and think.

Holographic Projection

Everything we experience takes place in the holographic world of our brain. From the moment we are born, we live by perceiving a tangible material dimension according to the physical conditions of the world we are born into. Our environment reinforces this perception. It becomes a belief and we become somewhat dependent on the universe we create. However, the universe, which was once seen as empty space with scattered particles of matter, and our brains are now scientifically accepted to be holographic projections. Evidence supporting the holographic reality has increased with each passing day. Information already known by individuals with mystical experiences has become more comprehensible through today's scientific research. Sufi practices like meditation, energy transfer, teleportation (tayy al-makan), rabita (spiritual connection), and tawajuh (spiritual concentration) are currently being applied by those who experience reality at the highest levels of consciousness.

Frequency, Vibration, Resonance, Interference

Life emerges within an ocean of energy. In other words, everything we perceive consists of vibrations and frequencies. It is like an ocean of frequencies, and we are a drop or a wavelength in that ocean. We refer to this as frequency or vibration value. These waves intersect and merge in specific spaces, creating certain patterns. A good example of this is when a stone is thrown into a pond, causing ripples to form, and then throwing another stone that creates new ripples, forming various patterns on the water. Where they reinforce each other, "resonance" occurs, meaning they amplify. When they meet at opposing angles, "interference" happens, meaning they cancel each other out. This resulting pattern is what we call a hologram. Ultimately, all beings in the universe exist within a holographic structure. Primarily, we communicate with other humans and the universe through the frequencies we generate. When our physical body produces appropriate vibrations, it leads to health, while the opposite triggers illness.

While the particle state allows for differentiation, the wave state is open to unity and integration. Just as when you tune into the correct frequency of a radio or TV channel, you can flawlessly receive the sound and image, information can also be drawn in the same way through resonance and wave alignment, with individuals acting as receivers. Both illness and healing should be understood

within this context. What is perceived takes shape according to the capacity of the perceiver.

CHAPTER 16 PERCEPTION OF REALITY AND SELF-PROJECTION

David Bohm - Objective Reality

In a 1982 study conducted at the University of Paris, it was discovered that subatomic particles, such as electrons, could instantaneously communicate with each other, regardless of the distance separating them. Whether they were 3 cm apart or 10 billion miles apart, these particles somehow knew what the other was doing. Under these findings, the renowned physicist David Bohm believed that objective reality does not exist, and instead, the universe is not a solid entity but a vast and incredibly detailed hologram. No matter how much you divide a hologram, each piece will still contain the whole. The appearance of separateness is merely an illusion. This situation is a universal snapshot of a web woven with cause-and-effect relationships, but in reality, everything is unified. The essence of the universe is nothing more than a holographic projection. The creation of the hologram occurs in a closed, ordered realm, while the emergence of the image manifests in an open realm. These images, perceived by those who exist, are necessary from a three-dimensional perspective. However, from the fundamental holographic structure of the universe, what we perceive is just a mere illusion or dream.

The concept of a holographic universe helps us explain all mystical and metaphysical experiences, the brain's holographic structure, parallel universes, lucid dreams, synchronicity, telepathy, and intuition. Death can also be understood within this framework, as the transition of a person's consciousness from one level of holographic reality to another.

John Archibald Wheeler's Participatory Universe Hypothesis

This fascinating idea suggests that the nature of the universe is shaped by the participation of the observer. The hypothesis offers a perspective that challenges the boundaries between quantum mechanics, cosmology, and philosophy. Wheeler argued that the universe doesn't just exist passively but is brought into being through observation. According to this hypothesis, the universe gains existence through the act of being observed by a conscious participant.

Wheeler extended the measurement problem in quantum mechanics, where the state of a particle is not determined until it is measured, to the whole universe, suggesting that the "reality" of the universe forms through observation. This hypothesis even suggests that observation can affect the past, supported by Wheeler's famous "delayed-choice experiments," where the behavior of a particle could be influenced by a future measurement. Essentially, an observation not only impacts the present but can also reshape the past.

Wheeler also proposed that the most fundamental building block of the universe is information. Known as "It from Bit," this idea suggests that everything in the universe can be expressed as information (bits), meaning that matter and energy can ultimately be reduced to information. Thus, the universe is made of information, and this information transforms into tangible reality (it) through the participation of an observer. Wheeler also put forth the idea that the universe creates itself, not only through the act of observation but by being part of the universe's self-construction. In this cyclical process, the observer and the universe complement each other.

The participatory universe hypothesis raises profound cosmological questions, such as when and how the observer's role came into play in a universe that began with the Big Bang. If the universe has a finite past, how does this hypothesis impact the history and evolution of the universe? Wheeler's participatory universe hypothesis also bears interesting parallels with mysticism, particularly in Sufism, where the human being is seen as a reflection in the creation of Allah, and this creation is considered a continuous process. This notion overlaps with Wheeler's view that the universe is shaped by the observer, emphasizing that the universe is not just a physical reality but a process shaped by conscious participation. In this framework, humans play an active role in shaping the universe by observing it, which brings up the concept of responsibility. A person's awareness of the nature of the universe brings with it the power to shape it.

Observation and Collapsing Waves

In quantum theory, the position of subatomic entities is uncertain until they are observed. We can only say that they exist somewhere within a cloud of probability. This probability cloud encompasses all possible states of the subatomic entity or quantum. Just like the hologram plate contains all the information of the universe, this probability cloud contains all the possible information of the quantum. Until an observer makes an observation or perceives the quantum, the cloud holds all the information. The moment the observer observes any aspect of it, that particular aspect materializes, gains dimension, and becomes finite and alive. All other possibilities collapse; or rather, they continue to exist at the quantum level. In quantum mechanics, this is called wave function collapse, best illustrated by Schrödinger's Cat. Essentially, whichever aspect we focus on becomes evident to us. Whatever we look at with a particular perception or "eye" reveals that "essence" to us. Whichever divine names (Esma) are active within us, we will reflect them as much as those names allow us to, and we will perceive accordingly.

The universe is programmed to manifest and become visible but requires perception, awareness, and observation. This process of manifestation involves transitioning from a wave state to a particle state. The world of objects or information comes to life through our perceptions, finding existence according to our perception. Ultimately, neither absolute existence nor non-existence can be defined. Only those records that are aligned with the divine names or structure of an observer come to life, gaining form and image. Other records remain potential, continuing to exist in their dormant state.

Self-Projection

In order to manifest form and come to life, perception is necessary. In short, the universe, or the realm of forms, is constantly being rebuilt and destroyed. Moreover, the existence of matter itself has lost its validity. It has been demonstrated that the existence of matter is merely an assumption valid only for the observer perceiving it. In other words, the observation of energy as matter stems from our way of perceiving. At the subatomic level, no trace of any observed object is found. Additionally, at this level, there can be no talk of boundaries or separations between objects.

Thus, the universe, as we perceive it, reflects us back to ourselves. It holds everything in potential. Since the observing mind is not independent of what it observes, it projects form and meaning according to its location and perspective. In reality, wherever we look, we see ourselves. We project ourselves. This is because there is no universe independent of the observer's mind that could present a different view. At this point, the potential capacity to access knowledge of the whole depends on the permissions granted, which are tied to the creation characteristics of the individual—referred to as the composition of divine names (Esma).

The Brain and Universe that Project Themselves

The idea of self-projection through the holographic brain is deeply connected to both quantum physics and brain research. Studies on the holographic universe theory and brain functioning suggest that our brain perceives the universe as a hologram, offering important clues to understanding how this perception creates the projections of our consciousness. The holographic brain theory proposes that the brain processes information in a holographic structure, meaning that each part of the brain contains knowledge of the whole and processes information in this way. When the brain perceives the external world, it uses this holographic structure to create a projection of reality. In other words, the brain processes information from the external world as a whole, and this holistic perception is reflected in the person's consciousness as reality. The concept of self-projection helps us understand how an individual's consciousness uses this holographic structure to shape reality. The brain gathers all sensory data from the external world and projects it as a conscious perception. This projection is shaped by the internal structures and functioning of the brain, as well as the individual's personal experiences, beliefs, and expectations. Thus, the individual stands at the center of this projection, and their own consciousness shapes the reality they perceive.

The holographic brain theory is also deeply connected to quantum physics. In the quantum world, the state of particles is uncertain until observed, and this uncertainty is projected as a form through the brain's holographic structure. In this process, consciousness interprets quantum events, and these interpretations are experienced as holographic projections created by the brain. In other words, an individual's conscious perception can shape quantum-level events, and this shaping is guided by the brain's holographic structure. In this context, self-projection explains how an individual's conscious experiences transform into reality through the brain's holographic structure. The brain processes quantum events and the external world as a hologram, and this process creates

the individual's conscious projections. These projections shape the reality the individual perceives, and as a result, the universe itself emerges as a reflection of the individual's consciousness. Thus, understanding how self-projection occurs through the holographic brain allows us to grasp how consciousness perceives the universe and how this perception creates a projection of reality. This reveals the profound connections between quantum physics, brain function, and consciousness, inviting us to think more deeply about our existence and the effects we have on the universe.

Quantum Illusion and Consciousness

The quantum world describes a universe where everything is interconnected and the observer can influence reality. In this context, the concept of "quantum illusion" involves the idea that reality may be a reflection or projection. This represents a radical break from classical physics and encourages us to ask profound questions about the nature of the universe and the individual's role in it. At the quantum scale, the state of particles remains uncertain until observed, and this uncertainty is resolved by the observer. Here, the concept of "self-projection" comes into play. Self-projection questions how an individual's consciousness and perception shape quantum-level events and possibilities, perhaps even creating reality. The principle of uncertainty, a fundamental tenet of quantum mechanics, offers deep insight into how the individual's perception and consciousness affect the inherently uncertain nature of the universe.

Self-projection also raises the question of how human consciousness interprets events and situations in the universe and how these interpretations are reflected in physical reality. Quantum physics suggests that consciousness may have a direct effect on the universe. In other words, an individual's thoughts, perceptions, and expectations could shape events in the quantum world. This implies that reality may be an illusion created by the individual's own consciousness.

In this sense, "Quantum Illusion: Self-Projection" represents an exploration of the mysterious and profound aspects of quantum physics while questioning how human consciousness influences the universe and how we might interpret this influence. This presents a perspective that goes beyond seeing the universe as merely a physical structure, striving to understand the role of consciousness and perception in shaping this structure. In the quantum world, reality is shaped by the observer's perception and consciousness, reinforcing the idea that the universe could be a product of our conscious projection. This illusion can fundamentally alter how an individual views the universe and invites us to better understand the depth of our own existence and consciousness.

Floating Names of God and Atomic Structure/Elements

We were born as observers into this realm (our world/cosmos/body). It is our choices and perceptions that create and define our existence. Within our limited cross-sectional structure (as much as we can reveal the names of God that allow for it), and within the limitations of our perspective... With the address, "Am I not your Lord?" the actions were desired to be revealed for witness to existence, to be known through our selective perceptions and the choices within those

perceptions. As a result of our choices and in alignment with them, we experience the results of God's laws in the material world, in a single NOW devoid of past and future definitions; manifesting perpetually and in all grandeur. All visible objects are, in terms of atomic structure, composed of bodies floating and oscillating in a sea of waves.

The Names of God (Esmâ-ül Hüsnâ) represent His various attributes and characteristics; each name expresses a specific divine quality or manifestation in the universe. Atomic structure and elements represent the fundamental building blocks of matter. Establishing a connection between these two concepts offers a metaphor or symbolic perspective to demonstrate how God's creative power manifests even in the smallest details of the universe. The atomic structure of each element is defined by specific order and laws. The specific numbers of protons, neutrons, and electrons come together to form elements, reflecting God's perfect order and wisdom in creation. God's name "El-Hakîm" (The All-Wise Creator) is an expression of this order and law in the universe. The order at the atomic level is a concrete manifestation of God's knowledge and wisdom.

Another example can be established between God's name "El-Kâdir" (The All-Powerful) and the relationship between power and energy in the structure of matter. At the atomic level, the bonds between elements and the energy of these bonds reflect God's omnipotence. Particularly, the strong nuclear force that holds protons together in the atomic nucleus is a sign of God's power. The immense energy released from the splitting of the atomic nucleus is one of the evidences pointing to God's infinite might. The unique properties of elements and atoms are manifestations of God's name "El-Musavvir" (The Fashioner). Each element possesses its own unique properties, colors, scents, and reactions. This diversity and richness is another manifestation of God's creative power. Similarly, the name "El-Hâlık" (The Creator) can be associated with God's creation of all elements from subatomic particles and thus all matter. God's name "El-Alîm" (The All-Knowing) is the source of knowledge and order in the universe. The information contained in the structure of atoms and elements reflects God's infinite knowledge. In quantum physics, the ability of each particle to exist with certain probabilities and the occurrence of these probabilities within specific rules reminds us of God's omniscience and control over everything. The presence of electrons at specific energy levels and their ability to transition between these levels can be associated with God's name "El-Muğni" (The Enricher). The transitions between energy levels represent the richness and dynamism of the universe. God is the sole force that creates and sustains this dynamism and energy. Furthermore, God's name "El-Vâsi'" (The All-Encompassing) is also connected to the diversity of elements and their transformation into different forms in the universe.

All material beings in the universe are composed of different combinations of elements. This diversity and the infinite possibilities of combinations should be seen as a reflection of God's infinite knowledge and mercy. Finally, through God's name "El-Câmi'" (The Gatherer), atoms come together to form molecules and matter. Different elements, by this name of God, serve as the building blocks that enable the construction of all material beings in the universe. God's name expresses unity and wholeness in the universe. In this context, the relationship established between the Names of God and the atomic structure and elements offers a profound perspective on understanding that everything in the universe is a reflection of God's divine attributes. This approach, which connects each element and each atom with the order, wisdom, power, and

knowledge created by God, opens a door to grasping the profound meaning of existence. Seeing how God's names manifest even in the smallest details of the universe is an important step in comprehending His might and majesty.

Quantum Measurement and Reality

Australian physicists have confirmed that reality—at least at the atomic scale—does not exist until it is measured. With the experiment we previously mentioned, John Wheeler's famous delayed-choice experiment was conducted for the first time using a single atom. His experiment, regarding whether light is observed as a wave or a particle, proposed that the decision made by the researcher conducting the experiment could "retroactively" affect whether a wave or a particle passed through a gap. According to this, whether the experiment was a particle or a wave experiment could be determined by the choice of the experimenter long after the light had passed through the gap. This implies that the past is created in conjunction with the present. In other words, "The universe becomes real when you look at it and observe it."

For John Archibald Wheeler, one of the leading physicists of the 20th century, everything is a dream and a theory. However, for him, conducting a quantum computation does not just provide us with an objective perspective; this computation also changes the course of the universe by selecting one of many possible outcomes. For instance, as seen in the famous "double-slit experiment," light behaves either as a particle or as a wave depending on the setup. The most complex part is how photons seem to know when and how they will change.

From here, we can proceed to the point that a photon has a physical form at the moment we observe it. Wheeler questions, "What if it only takes a form at the moment we look at it?" Indeed, the past may not even have been designed.

Wheeler presents a cosmic version of the double-slit experiment. In this version, light from a star located billions of light-years away travels around a galaxy that alters its path and comes to us, creating two images—one on one side of the galaxy and the other on the other side. Observing through a telescope directed at either, the observer sees that photons travel as particles through one of these paths. However, by adjusting the mirrors, they will be able to see that photons strike the detector simultaneously from both paths as waves. This time, to alter the structure of light from a star billions of years ago, the observation state transcends time. For Wheeler, this means: "The universe cannot exist in any physical sense until we measure it. Even the past; what we do now affects what we did in the past, in principle, on the entire path towards the origin of the universe." At this point, despite all existing intentions and purposes, the universe did not exist until we, and other conscious beings, began to observe it.

MIRRORING TECHNIQUE

Mirror Neurons

Mirror neurons are a special group of neurons in the human brain that help us understand the actions and emotions of others. These neurons become active not only when performing an action but also when observing someone else performing the same action. Mirror neurons form the basis of complex human behaviors such as empathy, imitation, and social learning. For instance, watching someone hold an object creates neural activity in the observer's brain as if they themselves were holding the object. This allows us to understand the intentions and emotional states of others and form emotional connections with them.

The connection between mirror neurons and quantum mechanics can be considered through concepts of consciousness and perception. Quantum theory describes the behavior of subatomic particles, which can behave differently when observed. This reveals a deep interaction between the observer and the observed. Similarly, mirror neurons allow us to "experience" others' actions in our own brains when we observe them. Thus, just like in quantum mechanics, observation and interaction play a central role here. Mirror neurons can also be associated with the concept of quantum entanglement. In a similar manner, mirror neurons can establish an instantaneous connection between individuals' minds, reflecting one's experience in another's brain structure. In this context, mirror neurons parallel the fundamental principles of uncertainty, observation, and interaction in the quantum world. In both fields, observation and interaction play a critical role in shaping reality, and the way the human brain processes social and emotional information through these neurons resembles the observer effect in quantum mechanics.

Mirror Divine Names

You interpret and give meaning to what you perceive as "other" by reflecting it through the amount of divine names you hold within. Therefore, all beings perceive and evaluate others to the extent of the divine names they possess.

When you align yourself with someone's frequency, you become attuned to them. Low-vibration individuals or situations lower your frequency and vibration, while striving to align with high-vibration personalities raises you up. On the other hand, the mirroring system is valid throughout the entire universe. The desire to respond to evil with evil is the first emotion that arises in the heart. However, if you can transform this reflection into goodness, you become the cause of endless positive reflections/waves. In this sense, the greatest transformers are the perfected human beings (insan-i kamil).

Each divine name continually emits its potential vibrational wave, and as much as you recognize, you become human (particle). The quantum field consists of infinite, boundless waves of divine name vibrations awaiting observation. Each of them is a frequency and, in essence, a quantum

structure. All existence and manifestations occur within this structure. Each holographic structure perceives, attracts, organizes, and forms its world through frequencies that are similar and equivalent to its own within the holographic system. Every situation and person we encounter (every entity around us) is programmed to reveal our divine names. In this sense, we also become the fate and reflector of others. At this point, each entity serves as a mirror for one another.

Angels That Grant Abilities

The melk (essence) is the original structure hidden in the truth of things. All forces gain existence and emerge through melk structures. These are the fundamental building blocks, conscious and intelligent structures limited by their duties. If an individual, society, or unit persists in and continuously engages in a certain behavior or action, they are supported by melk structures, and thus gain abilities in that area. Melk structures are radiative quantum structures in the form of conscious energy packets. Although we cannot see them, they ensure the general order and even form the basic structures of the atoms that make up our essence. Fundamentally, we are within angelic structures in the subatomic realm. In the supra-atomic realm, we are equipped with the title of khalifa (vicegerent) on the path of knowing Allah as human beings. This also happens through the divine names via angelic structures.

In Surah Fatir 1: "Praise be to Allah, Creator of the heavens and the earth, who made the angels messengers with wings—two, three, or four (pairs). He adds to creation as He wills. Verily Allah is able to do all things." The wings mentioned may be connected to the shell values (frequency values/mass values, etc.) of atoms or the structure of each electron jumping from one shell to another. Because the reason behind these jumps is not fully understood, it could be said that they occur through an effect known as the law of critical impact. Indeed, in the Quran, we know that angels carry out the commands they receive without question. This can be considered within the scope of the prostration of angels to Adam, as mentioned in Surah Ali Imran 124, Surah Al-An'am 9, and Surah Al-A'raf 11.

CHAPTER 18

CRITICAL EFFECT AND THE COMMAN "KUN" (BE)

The Law of Critical Effect In the quantum field, all possibilities exist as a unified whole. Infinite possibilities are present in infinite time frames, existing as potentials. For an event or phenomenon to occur, there must be a critical effect. If this critical effect does not happen, the event will not occur. Thus, in both the creation and distribution of existence, we can speak of the law of critical effect. Consequently, the law behind both orderly and chaotic coincidences is the "Law of Critical Effect." This effect is most intensely triggered moment by moment in the human mind or

consciousness under the name of "intentions." Mental activity, possibly transforming into this form of knowledge, creates a chain reaction, triggering other atomic and subatomic consciousness in a wave form. This interaction, combined with the observer's interpretation, leads to a completely new existence, resulting in composite, compound new structures. The negative systems we refer to as the Dajjal system also seek to carry out their manipulations under this law and order.

Quantized Systems The knowledge revealed through the human thought system has been quantized. All existences are already quantized systems (including time and space). Quantized systems function through a holographic structure. Ultimately, the idea that human thoughts are also quantized arises from the fact that thoughts, in a physiological sense, consist of very small electronic signals and are "energy." Thus, the issue becomes one of managing these "thought quanta." As a result, every thought we generate and every dream we form falls within the realm of "possibilities."

Quantum physics introduces us to a realm where classical physical matter transforms into energy. In this realm, subatomic particles are nothing more than rapidly moving energy particles. Furthermore, these particles respond to the energy emitted by human thought. It becomes apparent that the observer and the observed particle are not independent, separate entities. The distinction between thought and energy, observer and observed, inside and outside, here and beyond, dissolves. The thought packets we send into this field, which Heisenberg called the uncertainty principle, give existence to this field. They bring it into being. The impact we make on one point of the quantum field affects the whole.

The Impact of Thought When you think of something, the entire field is affected by it. Quantum physics is an area where physics and metaphysics intersect, a kind of "interworld." The verse, "Whatever good comes to you, it is from Allah, but whatever evil befalls you, it is from your own self" (Nisa 79) is one of the most beautiful pieces of evidence for us. "And each soul will be fully compensated for what it did, and they will not be wronged" (16 Nahl 111). This is the ultimate result of divine existence, the land of wisdom.

Returning to the issue of manipulation mentioned earlier: people who are in the quantum levels of consciousness and seek to gain perspective through Islamic values can have their reality shaken by a Netflix series. Even a song's arrangement of notes could disturb their mental chemistry, a pirated social media algorithm could disrupt their chain of contemplation, and their minds could be manipulated by a Dajjal-like theater. This reflects the negative consequences mentioned in the above verse, where evil comes from one's own self. Returning to the topic of energy and coincidence, if matter could be divided infinitely, we would ultimately be left with an entity of zero mass and zero volume. Today, we know that such an entity can exist. The photon, a light particle, has no mass and no volume. Every object is an energy packet; there is no distinction between living and non-living entities.

Coincidences and Energy Quanta In everyday life, we find the concept of "coincidence" as a reflection of uncertainty. There are two types of coincidences in the universe:

Chaotic coincidences: These coincidences cannot be tied to any rule, and it is doubtful whether they

ever will be.

Orderly coincidences: These are coincidences that have been observed to occur according to a rule.

For physicists, the concept of "coincidence" is worth studying only if it is orderly, as there are more fundamental rules underlying these orderly coincidences that need to be uncovered. For example, when a fruit ripens on a branch, it falls. We do not know when it will fall because there is no regular rule in its fall. However, since every ripe fruit falls, there is an underlying order to this coincidental structure. One of the rules that establishes this order is the "Law of Gravity," expressed by Newton. However, the law of gravity tells us how the fruit is pulled toward the ground and at what speed it falls but does not explain why it falls. Because it is easy to answer the question of "how," but it is much more difficult to answer the question of "why." The question of "why the ripened fruit falls" is due to a much deeper law. This law can be described as the law of the persistence of existence, meaning that an existing object does not entirely cease to exist. It simply changes form and finds a way to continue its existence.

Chemist Lavoisier (1743–1794) said, "Nothing is created from nothing, and nothing is destroyed into nothing." Based on our current understanding, we can say, "Every object is energy, and energy does not disappear but transforms." This transformation of energy is also the subject of physics. When studying the interactions of objects, physicists are essentially examining energy types and how they transform into each other. A physicist does not merely transform their observations into a consistent structure but also constantly questions the structure they have established, testing its success against new observations and experiments. For example, consider the electron jumps in an atom. Without sending photons with a certain threshold energy to the atom, you cannot make the electron jump from one orbit to another. However, the electron immediately gives back the photon energy it has received and returns to its previous orbit, releasing a photon equal to the energy difference between the two orbits. In this way, the atom continues to exist. Thus, "critical effect" plays an important role in both the quantitative and qualitative aspects of the existence of things.

Infinite possibilities present us with a complete uncertainty regarding how choices are determined, that is, according to which criteria such triggering occurs. Perhaps we will never know this. When the triggers that occur within the command of "Kun" (Be) are examined within the principles of Tawhid, the statement "La ilaha illallah" always directs us to a single point. The second part of our declaration of faith, "Muhammad is the Messenger of Allah," gives us the ability to act on the planes formed by the proliferation of other points from this singular point, allowing us the freedom of choice and will. Quantized thoughts and free, infinite possible energy quanta move within the boundaries of the first statement (the unity of Allah). We witness that this has been granted to us in the form of different appearances, variations, and manifestations of the initial trigger (Kun). With the command "Kun" (Be), the universe performs its artistry with every dimension, both subatomic and beyond, with the created time. Infinite triggers have been set into motion with a single command, and we are asked to be witnesses and observers of this.

CHAPTER 19

LIGHT AND NUR

Light carries profound meanings both in quantum physics and in the mystical teachings of Islam. These two seemingly distinct fields reveal how humanity perceives the universe and existence through the physical and metaphysical dimensions of light. Now, let us explore how the concept of light and photons in quantum physics aligns with the notion of nur in Islam, the symbolism of light in the Qur'an, and the spiritual journey of enlightenment in Sufism.

Light and Photons in Quantum Mechanics

Quantum mechanics reveals that light possesses both wave and particle properties, a concept known as wave-particle duality. This dual nature means that light can exhibit phenomena such as interference and diffraction while also behaving as packets of energy called photons. Photons are defined as quanta that carry energy as components of electromagnetic waves. The ability of photons to carry energy influences the energy levels of atoms, forming the foundation of technologies such as lasers, LEDs, and other modern advancements. Photons also play a significant role in phenomena like quantum entanglement, where entangled photons, no matter how far apart, influence each other instantaneously. This phenomenon illustrates how deeply connected the universe is at its core, echoing the belief of Sufi mystics that "everything is interconnected."

Nur in Sufism and Ibn Arabi's Theory of Existence

Sufism, as the mystical path of Islam, employs a metaphysical language to understand the existence of Allah and the relationship with Him. Nur, or light, in this context represents Allah Himself and His divine guidance. Ibn Arabi uses the concept of nur in connection with his doctrine of Unity of Existence (Wahdat al-Wujud). According to him, Allah's light is the foundation of all existence, and this nur is the essence of all creation. There is no existence independent of Allah. Ibn Arabi argues that this nur is Allah's very essence, called the "zat," and the universe exists as a manifestation of this divine light. This perspective parallels the quantum world's energy fields and wave functions. Just as every particle is represented by a wave function, every being is considered a reflection of the divine light.

Allah's nur in Sufism represents the divine light at the core of everything. This light expresses Allah's presence and the wisdom in His creation. In quantum physics, light exhibits both particle and wave characteristics. The fundamental nature of energy and light is the key to understanding the workings of the universe. A believer who experiences the Be Sırrı will comprehend the meaning of the following hadith: "The atom is a mirror of the whole." Note that it is called a "mirror," not the same as the whole. Those who cleanse and polish their hearts can reflect the Truth through this mirror and, in turn, serve as mirrors of the Truth to others, ultimately reaching Allah. All quantum

theories support this view, leaving no room for doubt that science will eventually have to acknowledge the existence of God.

Nur in the Qur'an and Cosmic Light

In the Qur'an, nur is used in both material and spiritual senses. One of the most significant verses is from Surah An-Nur, verse 35: "Allah is the Light of the heavens and the earth..." This verse emphasizes Allah as the ultimate guide and illuminator of the universe. Furthermore, the illumination of the human heart with divine knowledge symbolizes how this light penetrates human life. In the Qur'an, nur is also used to represent divine revelation, the right path, and faith. The metaphor of light in Surah An-Nur can be understood as divine knowledge that illuminates the human heart, just as physical light illuminates the world. Additionally, one could interpret that the nur, like physical light, has both wave and particle natures, drawing a metaphysical parallel between Allah's light and the physical light of the universe.

The Enlightenment of the Heart in Sufism and Cosmic Nur

The Sufi journey is the process of opening the heart to divine light. Sufis believe that the heart is illuminated by Allah's nur, which reflects in the heart and leads a person to spiritual truth. This process represents purification from ego and self-centered veils to reach divine truth. This enlightenment can be likened to the collapse of the wave function in quantum mechanics, where a particle transitions into a specific state. Similarly, when the human heart is illuminated by divine light, a particular truth emerges from all potential states, guiding the individual toward that truth.

Light holds significance not only in the physical sense but also on cosmic and microcosmic levels. In cosmology, according to the Big Bang Theory, the universe was created through a massive explosion of energy, which filled the universe with light. As the universe expanded, this cosmic light cooled and transformed into the form of energy we now call the cosmic microwave background radiation. This can be seen as a reflection of the divine nur at the beginning of the universe. On a microcosmic level, interactions between subatomic particles occur through energy exchanges and the transfer of photons. This indicates that Allah's nur exists even at the smallest scale and forms the foundation of all existence.

Time, Light, and Divine Wisdom

The concept of time is closely related to light. In Einstein's theory of relativity, the speed of light is regarded as a fundamental constant of the universe, and time is shown to be directly linked to the speed of light. The concept of divine time, however, indicates that Allah's nur transcends time. In Sufism, Allah's light existed at the beginning of time and remains beyond it. This creates another parallel between the relationship of light with time in the physical universe and the timelessness of nur in the spiritual realm.

Quantum physics and the concept of nur in Islam serve as a bridge connecting two different worlds. The nature of light in quantum mechanics closely parallels the metaphysical nature of divine nur in Sufism. Both concepts touch upon the deepest realities of the physical and spiritual universe. Whether it is the behavior of a photon in the quantum world or the nur in the heart of a Sufi, light serves as a source of guidance and enlightenment in both realms. Therefore, quantum physics and Islamic mysticism can be viewed as two faces of humanity's endeavor to understand the universe and existence, each offering different but complementary paths under the guidance of light.

CHAPTER 20

SUFISTIC PERCEPTION AND MYSTIC EXPERIENCES

The Quranic Time (The Moment-Creating Lord) and the Creation Processes

"Indeed, a day in the sight of your Lord is like a thousand years of what you count." (Hajj/47)

"He regulates all affairs from the heavens to the earth; then it all ascends to Him in a Day, the length of which is a thousand years of your reckoning." (As-Sajdah/5)

These verses indicate that time, as perceived by God, differs from human perception. In quantum physics, the flexibility of time and space is also discussed, particularly in relation to the theory of general relativity.

"He is in a state of constant creation." (Rahman/29) This verse emphasizes God's continuous creative power. In quantum physics, there is also constant motion and change in the universe. The quantum events that occur at every moment can be interpreted as an ongoing creation process at the microscopic level. The transformations, decays, and transitions, and quantum jumps within all quantum structures are encompassed in this context.

"We constructed the heaven with might, and indeed, We are [its] expander." (Adh-Dhariyat/47) This verse can be linked to modern cosmological findings regarding the expansion of the universe. Quantum physics and the theory of general relativity provide significant insights into the origin and expansion of the universe.

In Surah Al-Anbiya, verse 30 states: "Have the disbelievers not seen that the heavens and the earth were a joined entity, and We separated them and made from water every living thing? Then will they not believe?" "Allah existed, and there was nothing but Him. His Throne was upon the water." (Bukhari, Tafsir, Hud/1) This hadith points to the beginning of the universe and its connection to water in the creation process.

The Multiverse, East and West

“All praise is due to Allah, Lord of the worlds.” (Al-Fatiha/2) The “worlds” mentioned here are not limited to the physical universe; they encompass other levels of existence. This can be related to the multiverse theories discussed in quantum physics.

In quantum physics, concepts such as particles being in multiple places at once (superposition) and communicating instantaneously (quantum entanglement) go beyond the classical laws of physics and challenge conventional understanding of reality. In Sufism, it is believed that the universe is unified and that God manifests in everything. In Sufi thought, there is no distinction between beings; everything is a manifestation of the Divine. This concept parallels the interconnectedness and unity observed in quantum physics.

“To Allah belongs the east and the west. So wherever you turn, there is the face of Allah. Indeed, Allah is all-Encompassing and Knowing.” (Al-Baqarah/115)

Uncertainty and Trust in God

Quantum physics reveals the principle of uncertainty through Heisenberg's Uncertainty Principle, which states that it is impossible to precisely know both the position and momentum of a particle simultaneously. In Sufism, the uncertainty of worldly life and the necessity of trusting in God (tawakkul) are emphasized. Humans cannot control everything, and thus must trust in Allah. This concept resonates with the uncertainty principle in quantum physics.

“... It may be that you dislike a thing and it is good for you, and it may be that you love a thing and it is bad for you. Allah knows, and you know not.” (Al-Baqarah/216)

“And put your trust in Allah, and sufficient is Allah as a disposer of affairs.” (Al-Ahzab/3)

“For He is the All-Hearing, the All-Knowing.” (Ash-Shuara/220)

“It is You we worship, and You we ask for help.” (Al-Fatiha/5)

Observation and Destiny

In quantum physics, the act of observation affects the system being observed, showing that reality is linked to observation. In Sufi thought, it is believed that a person's spiritual state and perspective shape the reality they perceive. From a Sufi viewpoint, someone close to Allah can see His manifestations everywhere. Both quantum physics and Sufism emphasize the importance of the observer's perspective. This perspective can even alter the fabric of reality, as human beings are highly susceptible to suggestions and their own viewpoints.

As stated in the Quran, “We created man, and We know what his soul whispers to him, and We are closer to him than [his] jugular vein.” (Qaf/16) This verse illustrates how intimately God knows the

inner reality of a person, linking their inner world to their observations and intentions.

From the perspective of quantum physics, it can also be said that the observer affects the external world simply by observing it. At the subatomic level, everything is interconnected, and nothing is independent. This concept closely aligns with the notion of intention in Sufism. In other words, there is only one true observer in the universe: Allah. Even death can be described as a return to this ultimate observer.

The following verse from Surah Hud reinforces this truth: "Indeed, I have placed my trust in Allah, my Lord and your Lord. There is no creature that walks on the earth but that He holds its forelock. Indeed, my Lord is on a straight path." (Hud/56). In this verse, the Prophet Hud (peace be upon him) expresses his trust in Allah. The phrase "holds its forelock" symbolizes Allah's absolute control over everything. In other words, Allah fully controls the destiny and existence of every living being.

Ultimately, there is no duality between consciousness and the material world. The observer and the observed constantly transform into each other, creating an illusion of separation. This truth is explained in the following verse from Surah Al-Hadid: "And He is with you wherever you are. And Allah, of what you do, is Seeing." (Al-Hadid/4)

The reality that the observer affects the system in quantum physics can be related to the concepts of destiny and human will. According to Islamic belief, there is a balance between human will and divine decree. Allah knows and directs everything, but humans have free will. Destiny refers to Allah's knowledge and planning of future events, while will refers to His power to guide and control. However, Allah's decree reigns supreme; He guides whom He wills and leads astray whom He wills.

"Allah does not wrong people at all, but it is the people who wrong themselves." (Yunus/44)

Fate and Free Will

The concept of fate is one of the most significant topics in many religions and philosophical systems. In Islamic belief, fate is regarded as the idea that Allah governs the universe and that everything is predetermined. Certain similarities and connections between the concept of fate and quantum physics can be observed. In Islam, fate expresses that Allah governs the universe as He created it and that everything occurs within His knowledge. While fate is reconciled with human free will, it is also accepted that Allah's divine will surpasses everything. The events and decisions in a person's life are determined by Allah's knowledge and decree.

In quantum physics, the uncertainty principle states that a particle is not in a definite state and exists within uncertainty. Similarly, the concept of fate also entails uncertainty and unpredictability. This can express a situation akin to understanding the relationship between human free will and Allah's decree. The uncertainty principle in quantum physics indicates that we cannot know a particle's position and momentum simultaneously with certainty. Some suggest that this principle may resemble human free will. In other words, just as in the uncertainty principle, some argue that

humans can freely choose among various possibilities instead of being bound by predetermined outcomes. The only difference is that Allah, due to His attribute of Alim (All-Knowing), knows which option the servant will choose within all this uncertainty, which can be explained by the concept that all times have already occurred and continue to do so in the Moment (An) that encompasses all times.

“In Allah’s knowledge, the pen (which writes everything) has dried (everything has been completed).” (Hadith)

In quantum physics, a particle can exist in multiple states at once. Similarly, in the understanding of fate, there are multiple possibilities and options. Events in a person’s life may exist in a state of superposition between different choices. Quantum superposition refers to the idea that a particle can be in more than one state simultaneously. According to some, this mirrors the process of decision-making in which a person evaluates different options and makes choices among various possibilities. Therefore, human free will may be based on the presence of different possibilities during the decision-making process. In quantum physics, the observer effect suggests that observing a system can affect the system. This may resemble the idea of divine will in the understanding of fate. The events and decisions in a person’s life are determined by Allah’s knowledge and will, but human actions can also influence this process. The observer is sometimes the servant (Kul) and sometimes the Lord (Rabb). Allah speaks from both the servant’s and the Lord’s perspectives (Particle and Wave Duality). The evidence for this is Surah Al-Fatiha. The Wali (saint) who understands quantum mechanics knows when, where, and in what form to speak within the boundaries set by Allah and under the authority granted to him, witnessing events as an observer (The Level of Witnessing, Shuhud) and declaring, “I bear witness that there is no deity but Allah.”

Quantum Entanglement and Mystical Experience

Quantum entanglement expresses the idea that two particles can be connected and one can instantly affect the other. To some, this may relate to the belief that people and events are interconnected and that decisions can have universal consequences.

Sufism includes deep spiritual and mystical experiences. Sufis aim to draw closer to Allah through remembrance (dhikr), worship, and contemplation. Quantum physics has also sparked debates about the nature of consciousness and quantum consciousness theories. Some theories suggest that consciousness may be connected to quantum processes. Such theories imply that mystical experiences might be explained by quantum physical processes.

“Indeed, in the remembrance of Allah do hearts find rest.” (Surah Ar-Ra’d, 28)

“Remember Me, and I will remember you. Be grateful to Me, and do not deny Me.” (Surah Al-Baqarah, 152)

Quantum Tawhid

Tawhid, the concept of the oneness of Allah, is a fundamental idea in Islam. Quantum physics, while a branch of science explaining how matter and energy behave at their most fundamental levels, also presents us with connections and parallels at the highest level. Tawhid expresses the unity of all existence and the singularity of Allah, while quantum physics describes how all matter is essentially composed of energy fields interacting with one another. This highlights the unity and interconnectedness of the universe.

Tawhid asserts that Allah sees, hears, and knows everything, while quantum physics suggests that an observer affects the system they observe. This emphasizes the connection between the observer and the observed. Tawhid acknowledges that humans have limited knowledge in the face of Allah's infinite knowledge, while quantum physics, through Heisenberg's uncertainty principle, suggests that we cannot simultaneously know both a particle's position and momentum with certainty. Both emphasize the unknown and the limitations of knowledge.

Tawhid emphasizes Allah as the Creator and Controller of everything, while quantum physics suggests that all existence in the universe ultimately originates from a single energy field. Both stress the notion of creation and energy stemming from a fundamental source.

The Realm of Names (Esma) and the Realm of Acts (Wave-Particle Duality)

The Realm of Names (Esma Mertebesi): It is the level where the divine names attain their qualities through the descent of Rahman's lordship (rububiyet). This is where each name manifests with its own characteristics. The Qur'anic equivalent of this is the verse: "He taught Adam all the names" (Al-Baqarah /31). This level refers to the acquisition and compaction of the divine names within the human soul. These names exist potentially from the first level and become active at every stage of existence.

The Realm of Acts: This refers to the creation of the human body in the material world (within the scope of classical physics). Since the material world necessitates a body, humans are created here with a physical body. Previous levels are spiritual (batini) dimensions. The existence of humans in this world is described by the verse: "Allah created man from sounding clay like pottery" (Ar-Rahman /14). Therefore, man becomes visible through Allah's name "Zahir" (The Manifest). Allah wished to combine the darkness of the body with the speaking soul (nefs-i natika) and created man in the most beautiful form (Ahsen-i Taqwim), both externally and internally. This level is expressed in the Qur'an by the verse: "When the souls are paired (with their bodies)" (At-Takwir /7). Human existence is realized at the Essence (Zat) level "in His image," at the level of Attributes and Names "in the image of Rahman," and in the world of witnessing (Shahada) through the name "Zahir." In Sufism, these principles are upheld: "The name is identical to the Essence" and "Attributes cannot be separated from the Essence." These principles help clarify the hadith: "Allah created Adam in His and Rahman's image." Allah defines His divine identity as: "He is the First, the Last, the Manifest, and the Hidden" and "He is Knower of all things" (Al-Hadid /3).

In quantum mechanics, we know that a particle is described by a wave function as long as it is not observed. This wave function expresses the probability distributions of quantities like position and momentum. However, when an observation is made, the wave function collapses, and the particle transitions to a specific position or momentum state; this represents the shift from a “wave” state to a “particle” state.

Esma Level (The First and The Hidden): The potential state of divine names in the Esma level is comparable to the wave function in quantum physics. Here, the divine names (The First and The Hidden) exist unobserved and in potential. Just as a particle exists in a wave state before being observed, these names maintain a potential, wave-like state unless perceived by the observer (human). In this case, the “no observer” state is akin to the probability distribution of the wave, where the names exist in a potential manner, similar to a wave function.

Act Level (The Last and The Manifest): When the observer intervenes, that is, when an action takes place (act level), this potential state becomes materialized. The wave function collapses, and the particle appears in a definite position. Here, when divine names manifest as acts, they become evident through the names The Last and The Manifest. This represents the transition of the potential wave into a concrete reality (particle) upon being observed. As an observer, humans influence this process and bring what is potential into the visible (manifest) form.

The verses “Whichever way you turn, there is the face of Allah” and “He is the First, the Last, the Manifest, and the Hidden” express that the divine presence exists in every state and at every level. From the perspective of quantum physics, these verses indicate that divine reality exists both as potential (wave) and concrete (particle). Before the observer intervenes, this divine reality, existing as a wave through The First and The Hidden names, becomes manifest in the form of a particle through The Last and The Manifest names when the observer is involved. The verse “Whichever way you turn, there is the face of Allah” also supports this connection. In quantum physics, this divine presence, existing in every direction as potential and emerging as a different reality (particle) with each observation, can manifest everywhere and in every form. This illustrates that Allah’s presence is reflected in every corner of the universe, and wherever we turn, we can see traces of His existence.

The Secret of Be

Niyazi Misri, who lived in the 1600s, says: “This world is a copy in the knowledge of Truth, but this human is merely a dot in that copy. Inside that dot are hidden thousands of seas, and this universe is but a drop from those seas.” Everything is interconnected. In quantum physics, this reflects a similar notion. If you look inside an atom, you’ll see a structure similar to a solar system. The key is to perceive this unity and act with that knowledge. The metaphorical similarities between the “Be secret” and quantum physics reveal both the spiritual depths of Sufism and the discoveries of quantum physics in understanding the fundamental building blocks of the universe. Islamic mysticism strives to understand the hidden truths of the universe and Allah’s secrets, while quantum physics explores the fundamental nature of matter and energy and the uncertainties

between them. Although these two fields belong to different disciplines, they converge in their quest to discover the deeper meanings of the universe and existence.

SECTION 21

LEVELS OF THE SELF (NAFS): Quantum Theory Connections and Quantization

Stages and Theories The levels of the self (nafs) represent stages in the spiritual purification and journey towards closeness to Allah in Sufism. There are commonly seven recognized stages of the self, which reflect the individual's progression in their spiritual purification:

Nafs al-Ammara (The Commanding Self)

Nafs al-Lawwama (The Blaming Self)

Nafs al-Mulhima (The Inspired Self)

Nafs al-Mutma'inna (The Tranquil Self)

Nafs al-Radiyya (The Content Self)

Nafs al-Mardiyya (The Self Pleased with Allah)

Nafs al-Safiyya (The Purified Self)

When considering metaphorical connections between the levels of the self and quantum physics:

I. Nafs al-Ammara and Heisenberg's Uncertainty Principle

Nafs al-Ammara, the lowest level, is where the individual is a slave to desires and worldly passions. The Uncertainty Principle states that it's impossible to simultaneously know both the position and momentum of a particle with certainty. Nafs al-Ammara reflects the internal confusion and uncertainty within the individual, mirroring how one's inability to control their self makes it difficult to find direction in their spiritual journey.

II. Nafs al-Lawwama and the Observer Effect

At the Nafs al-Lawwama stage, the individual starts recognizing their mistakes and blames themselves for them. The Observer Effect in quantum mechanics refers to how the act of observation affects the state of a system. Nafs al-Lawwama reflects the stage where the individual begins to observe and assess their inner condition, marking the first step toward spiritual change and growth.

III. Nafs al-Mulhima and the Principle of Superposition

Nafs al-Mulhima is the level where the individual receives inspiration and can distinguish between right and wrong. The Superposition Principle states that a particle can exist in multiple states at once. Similarly, at this stage, the individual experiences various spiritual states simultaneously, akin to superposition, balancing both worldly and spiritual conditions.

IV. Nafs al-Mutma'inna and Quantum Entanglement

Nafs al-Mutma'inna is the stage where the individual attains peace and satisfaction. Quantum Entanglement describes how two particles become linked and cannot be described independently of each other. This stage symbolizes the deep connection the individual forms with Allah, similar to the inseparable bond seen in quantum entanglement.

V. Nafs al-Radiyya and Wave-Particle Duality

Nafs al-Radiyya is the level where the individual is content with Allah's will and surrenders completely. Wave-Particle Duality describes how matter and energy exhibit both wave-like and particle-like properties. At this stage, the individual accepts both worldly and spiritual states and sees their unity, much like the duality of waves and particles.

VI. Nafs al-Mardiyya and Quantum Field Theory

Nafs al-Mardiyya is the stage where the individual has gained Allah's pleasure. Quantum Field Theory explains the interactions of quantum particles and fields. At this level, the individual attains harmony with all creation, representing the continuous interaction and connection between all beings, just as quantum fields interact with particles.

VII. Nafs al-Safiyya and the Unity of the Quantum Field

Nafs al-Safiyya is the highest level, where the individual becomes completely pure and united with divine oneness. The Unity of the Quantum Field theory holds that all particles and energies in the universe are manifestations of a single underlying field. Similarly, Nafs al-Safiyya symbolizes the individual's complete purification and realization of the unity of all existence originating from a single divine source.

The connections between the stages of the self (nafs) and quantum physics bear many similarities on metaphorical and philosophical levels. While the stages of the self represent different phases of a person's spiritual journey, quantum physics explains how matter and energy behave at fundamental levels. Therefore, in each stage of the self, the wave takes a different position. Each fluctuation and change allows a person to experience their self (nafs al-natiqa) in different forms in the sight of God. As the person recognizes themselves in different forms and waves in each stage, they embark on the path of knowing God through different dimensions, in line with the saying, "He who knows himself, knows his Lord." This leads to the attainment of certainty (yaqin). These connections deepen one's spiritual and scientific understanding, helping them better comprehend their place and potential in the universe, thus reaching the station of being a vicegerent and understanding the mystery of "Be."

Quantization

The term “quantization” in quantum mechanics refers to the fact that certain physical properties of a system can only take on specific discrete values. This concept, which contrasts with the continuous variables of classical physics, is one of the fundamental characteristics of quantum physics. Quantization is directly related to small energy packets called “quanta.”

Energy Quantization: To be quantized means that the energy of a system can only take certain, discrete values. For example, electrons in an atom occupy specific energy levels, and the energy difference between these levels is fixed. Electrons lose or gain energy when transitioning between these levels, but the amount of energy is quantized. Electrons cannot exist at intermediate energy levels.

Light and Photons: Light consists of energy packets called photons, which exhibit both wave and particle properties. Photons are discrete units with a specific frequency and energy, meaning light itself is quantized, existing in packets at specific energy levels.

Quantum Numbers: In atoms and other quantum systems, quantum numbers determine a particle’s energy levels, angular momentum, and other properties. These numbers are also quantized, meaning they can only take on specific values.

Examples include:

Electron Energy Levels: Electrons in an atom occupy specific, quantized energy levels. As they transition between these levels, they absorb or emit fixed amounts of energy.

Photon Emission: When an electron drops from a higher energy level to a lower one, it emits a photon with energy equal to the difference between the two levels. This process is quantized, as photons can only be produced at specific energy levels.

Classical physics often deals with continuous variables. For instance, the height or speed of a ball can change continuously and take any value. However, in quantum mechanics, certain physical quantities can only take specific (quantized) values. This is a crucial concept for understanding behavior at the atomic and subatomic levels. The expression “to be quantized” reflects this fundamental discrete nature of the quantum world and plays a central role in understanding quantum mechanics. This concept is vital in fields like quantum physics and quantum technologies.

The phrase “Electrons cannot exist at intermediate energy levels” refers to the fact that in quantum mechanics, an electron’s energy levels within an atom are discrete, and electrons can only exist at these specific levels.

Discrete Energy Levels: Within an atom’s structure, electrons occupy specific energy levels defined by quantum mechanics. These levels represent discrete energy values, meaning an electron can only occupy predetermined energy levels.

Absence of Intermediate Energy Levels: Electrons cannot exist between these discrete energy levels. In other words, when an electron transitions from one energy level to another, it does not

linger in an intermediate energy state. The electron makes a sudden jump during a level change, altering its energy.

Absorption or Emission of Energy: When an electron transitions to a lower energy level, it emits a specific amount of energy. Similarly, to move to a higher energy level, it absorbs a fixed amount of energy. This energy change can only occur in quantized values because the energy levels are discrete. Therefore, no intermediate energy level exists; the electron absorbs or emits energy in quantized packets when transitioning between levels.

Example: In a hydrogen atom, if an electron transitions from the $n = 1$ energy level to the $n = 2$ energy level, it can only absorb the specific energy difference between these two levels. The electron cannot be “halfway” between these two energy levels; it can only be at either $n = 1$ or $n = 2$.

This situation is a result of the “quantized” nature of quantum mechanics, which differs significantly from classical physics rules. It is one of the fundamental principles of the quantum world and plays a crucial role in understanding subatomic particle behavior. If we approach the statement “Electrons cannot exist at intermediate energy levels” from a mystical, Sufi, or metaphysical perspective, we can associate this with the process of reaching specific layers, stations, or stages of existence and consciousness.

Sufi Stations and Discrete Energy Levels of Electrons

In the Sufi tradition, the spiritual journey of a human being is defined as a process of passing through specific stages to attain closeness to God. These stages consist of various phases, such as “Nafs-i Ammara” (the commanding self), “Nafs-i Lawwama” (the reproaching self), and “Nafs-i Mutmainna” (the contented self). Just as electrons cannot exist at intermediate energy levels, a spiritual seeker cannot move to the next stage without completing the current one. This suggests that each spiritual phase must be fully experienced in a quantized manner, with no “intermediate stages.” The journey occurs in distinct steps, just like the sudden transitions of electrons between energy levels.

Unity of Being (Wahdat al-Wujud) and Energy Levels

The doctrine of Wahdat al-Wujud posits that all existence is a reflection of divine unity, and everything exists according to divine order and balance. From this perspective, the fact that electrons occupy specific energy levels and cannot be in an “undefined” state between levels symbolizes that existence is governed by a precise divine order. Every being has a designated level in accordance with God’s will, and it cannot transcend this level. This understanding suggests that every atom and particle of existence is part of divine wisdom, with everything in its rightful place, moving with purpose. From a Sufi viewpoint, understanding one’s place in this order and living accordingly can be seen as an expression of spiritual maturity.

Spiritual Consciousness Levels

In mystical approaches, it is accepted that human consciousness consists of specific levels. Consciousness ascends to higher levels of maturity at each stage. Like the discrete energy levels of electrons, these levels of consciousness are sharply divided. Transitioning from one level to another is only possible when a person fully comprehends that level. There is no partial experience or incomplete transition. This emphasizes that spiritual evolution progresses in distinct steps and that each stage is a process that must be fully lived.

Spiritual Leaps: The Journey to Sidrat al-Muntaha

In the Sufi tradition, Sidrat al-Muntaha is known as the final point where the soul is closest to Allah. This point represents the boundaries of the divine realm, where the human soul transcends the material world and steps into the realm of pure existence. Similar to the sudden jumps of electrons between energy levels, such leaps occur in the spiritual journey of a person. However, these leaps do not only manifest in consciousness but also in the profound connections between the essence of the soul and the entirety of existence.

Sidrat al-Muntaha is also seen as a "final test" or a "sublime threshold" for the individual. When the soul reaches this point, it synthesizes all of its previous experiences, and the material world is completely left behind. The comprehension of divine truth is only possible upon reaching this point, representing the highest level of consciousness. Each spiritual leap in this journey is a step in the soul's path to its essence; every leap is seen as an expression of the soul's desire to be closer to Allah.

These leaps are not simple progressions or linear developments, but profound and sudden transformations that occur within the layers of existence. Just as there is no "intermediate stop" or temporary state between an electron's energy levels, there is no indefinite transition phase in the spiritual journey either. When a person moves from one spiritual rank to another, their spiritual consciousness is completely renewed. This leap is not merely a mental awareness but a complete reconstruction of the soul and the entire structure of existence.

The spiritual significance of Sidrat al-Muntaha lies in its being the final stop where one witnesses the absolute manifestation of Allah. At this stage, all veils of divine truth are lifted, leaving only pure existence. In this sense, Sidrat al-Muntaha is a final stage beyond all human perceptions and worldly limitations, where the soul fully merges with the will of Allah. Here, everything dissolves into the absolute existence of Allah; there is no longer a separate self or individual existence, only a return to the unity of Allah.

In conclusion, the journey to Sidrat al-Muntaha is not an adventure of existence, but the highest peak of approaching Allah. Just like quantum leaps of electrons, spiritual leaps are instantaneous, sharp, and absolute transformations. Each leap is a moment of transformation, where the soul steps

closer to the truth of Allah, walking the fine line between existence and non-existence.

Allah's Will and the Wisdom of Predestined Fate

This metaphysical perspective emphasizes the absolute will of Allah and the certainty of fate. Just as electrons can only exist at specific energy levels, beings also move within the divine order and destiny established by Allah. A person is obligated to align with this divine order and accept their predestined fate. There is no intermediate state or escape; either one acts in accordance with the divine plan, or deviations occur. However, in any case, one cannot step outside the path laid out for them.

CHAPTER 22

SAINTS AND QUANTUM

In the stories of saints and Islamic tales, miracles are often described on a spiritual and mystical level. The connections between these stories and modern scientific fields like quantum physics can be explored. Some of the events and miracles mentioned in these tales may show parallels with quantum theories. Below are examples of stories where connections can be drawn between such miracles and quantum physics.

The Invisibility of Hazrat Khidr and Elijah

The ability of Hazrat Khidr and Elijah to exist in a dimension unseen by humans bears resemblance to the concept in quantum physics where particles exist in different wave functions when unobserved. In quantum theory, particles can be in superposition, existing in multiple states simultaneously until observed. Hazrat Khidr's sudden appearance at various times and places can be likened to a particle gaining a defined position upon observation. Just as in quantum entanglement, the ability of Hazrat Khidr and Elijah to transition between dimensions suggests that this connection might exist at a quantum level.

Yunus Emre and the Subatomic Order

The deep mystical insights of Yunus Emre regarding the order and subtleties of the universe can be interpreted through modern physics theories. For example, Yunus Emre's famous line "There is a self within myself" resonates with the idea in quantum physics that even within the internal structures of particles, there is constant uncertainty and superposition. In quantum mechanics, the impossibility of knowing both a particle's position and momentum with absolute certainty mirrors

Yunus Emre's descriptions of the inner, undefined world.

The Influence of Abdulkadir Geylani on Matter

The influence of Abdulkadir Geylani on matter and his miracles can be seen as a reflection of interactions and uncertainties at the quantum level. For instance, it is said that Abdulkadir Geylani once healed a sick person by merely touching them. This could be related to concepts in quantum physics such as entanglement, where after two particles become entangled, the state of one can affect the other regardless of the distance between them.

Hacı Bektaş Veli and the Phenomenon of Multiple Locations/Times

Before Hacı Bektaş Veli's passing, he told those around him, "Someone will come to take my body, give it to them." Indeed, someone came to claim the body, but they hesitated to give it to this unknown figure. Eventually, the mysterious figure had to lower their veil, and to their surprise, it was Hacı Bektaş Veli himself. Saints can travel through time and be in multiple places at once.

Nasreddin Hodja and Quantum Possibilities

When a man from Nevşehir asks Nasreddin Hodja, who was in Akşehir, "Hodja, what time is it?", the Hodja's response is as surprising as always: "I don't know, I'm a stranger here." In quantum physics, time and space are not absolute. Nasreddin Hodja, being a sage, may have been alluding to this. Similarly, his famous act of throwing yeast into the lake, saying, "What if it works?" echoes the world of quantum possibilities, where anything is possible. It might work... or it might not.

When asked who he was, Nasreddin Hodja responded, "Nothing." When they dismissed him, he asked, "Who are you?"

"I am a governor," the man said proudly.

"And after that?"

"Perhaps I'll become a vizier."

"And after that?"

"I might become the grand vizier."

"And after that?"

The man, realizing there was no higher position, humbly replied, "Nothing."

"Then why are you so proud!" said Nasreddin Hodja. "I have already reached the position it will

take you years to reach: the station of 'nothingness'!"

Hazrat Mevlana also expressed his state of nothingness similarly: "Didn't you ever hear of my fame in this world? I am nothing, nothing!"

These stories contain metaphorical similarities and parallels with key concepts of quantum theories. The notion that saints were aware of quantum theories may seem plausible when their miracles and tales are examined, shedding light on certain phenomena discovered by modern science.

Quantum Teleportation and the Throne of Bilqis

The story of Bilqis' throne being transported is among the tales of Hazrat Suleiman and presents an interesting connection with quantum physics. This event is recounted in the Qur'an in Surah An-Naml. Hazrat Suleiman asked for Bilqis' throne to be brought in the blink of an eye. The story is told as follows:

"He said, 'O assembly [of jinn], which of you will bring me her throne before they come to me in submission?' A strong jinn said, 'I will bring it to you before you rise from your place, and indeed, I am for this [task] strong and trustworthy.' But one with knowledge of the Scripture said, 'I will bring it to you before your glance returns to you.' And when [Solomon] saw it placed firmly before him, he said, 'This is by the favor of my Lord.'" (An-Naml 27:38-40)

In this story, the transportation of Bilqis' throne in the blink of an eye bears interesting parallels to the logic of 1 and 0 in quantum systems. The event described can be seen as a continuous transition between existence and non-existence. In quantum physics, a particle can exist in multiple states simultaneously, in superposition, just as Bilqis' throne was transported instantly from one place to another. This phenomenon could be linked to quantum tunneling or instantaneous relocation, where in the quantum realm, the transition between 1 (existence) and 0 (non-existence) occurs. In other words, Bilqis' throne briefly disappeared (0) and simultaneously reappeared in another location (1). This event can be seen as a manifestation of Hazrat Suleiman's divine wisdom and power. In Sufi thought, it is believed that everything is continuously created and destroyed by Allah, meaning that creation is renewed every moment. This idea corresponds to the discrete structure of quantum systems and the logic of continuous existence and annihilation. The transportation of Bilqis' throne is a symbol of Allah's constant power to create and annihilate. Thus, the bringing of Bilqis' throne to Hazrat Suleiman's presence can be seen as a reflection of the divine will shaping the fine line between existence and non-existence in quantum physics. This event shows that the transitions between existence and non-existence are not just physical processes, but also manifestations of divine power.

Somuncu Baba and Superposition

One of the frequently told stories in Anatolia and the Islamic world is about a beloved of Allah, said

to have the miracle of exiting the mosque from different doors at the same time. Such events are generally considered one of the miracles (karamats) granted to those who have reached the rank of sainthood. One of the most well-known names in these stories is Somuncu Baba. After giving a sermon at the Ulu Mosque, Somuncu Baba was able to exit through multiple doors simultaneously. This event was seen as a manifestation of his spiritual power and the miraculous gifts bestowed upon him by Allah. When his disciples and the people witnessed this, they understood more deeply the greatness of his saintly status. Somuncu Baba lived during the time of Yıldırım Beyazıt and used to bake and sell bread in Bursa. While the Ulu Mosque was being built, he would bring the loaves he baked in his small oven and distribute them to the workers. The bread from his tiny oven was enough for all the workers, and everyone was sustained by it.

When the construction of the Ulu Mosque was finally completed, Yıldırım Beyazıt asked Emir Sultan to deliver the first sermon. Emir Sultan told the sultan that Somuncu Baba resided there and that it was more appropriate for him to give the sermon. The sultan asked Emir Sultan to convey his request to Somuncu Baba. After much insistence, Somuncu Baba finally agreed to deliver the sermon. During the sermon, he provided seven different interpretations of the Fatiha Surah. After finishing, he said, "The first interpretation of the Fatiha Surah can be understood by the entire congregation, the second interpretation can be understood by a large part of the congregation, the third by half, the fourth by a smaller portion, the fifth by very few, the sixth by only a few individuals, and the seventh only by myself." Seeing the spiritual greatness of their beloved Somuncu Baba, the congregation wanted to kiss his hand as they left the mosque. Somuncu Baba did not refuse and allowed the congregation at all three doors of the Ulu Mosque to kiss his hand. Thus, everyone in the congregation had the honor of kissing his hand. As the congregation dispersed and shared their experiences, they realized that despite exiting through different doors, they had all kissed his hand. Somuncu Baba had been present at all three doors simultaneously, allowing them to kiss his hand.

Nearly 500 years later, the phenomenon of being in different places at the same time was first observed in quantum mechanics. The difference here is that so far, only subatomic particles have been observed to be in different positions at the same time. In quantum physics, a particle can exist in multiple states simultaneously. Somuncu Baba's simultaneous exit from different doors can be compared to this superposition state. Like particles, beloveds of Allah may also exist in a spiritual state of superposition.

Rumi's Anecdotes in Quantum

Mevlana Jalaluddin Rumi was a great Sufi poet and philosopher who lived in the 13th century. His teachings and stories are renowned for their deep spiritual insights and metaphorical expressions. Some events and ideas in Rumi's works and anecdotes bear parallels with modern quantum physics.

I. Unity of Existence (Wahdat al-Wujud)

One of Rumi's most important philosophical concepts is "Wahdat al-Wujud," meaning the unity of all existence. In quantum physics, all particles in the universe are thought to be connected within an energy field. Rumi's words can be understood in this context: "We are waves of the same sea, leaves of the same tree," and "Everything is interconnected." These expressions can be likened to the quantum entanglement concept. In quantum entanglement, two particles can instantly communicate with each other no matter how far apart they are. Rumi's understanding of the unity of existence expresses the idea that everything in the universe is inherently one.

II. Beyond Time and Space

A recurring theme in Rumi's works is the possibility of existence beyond time and space. This theme parallels quantum physics, where time and space are considered relative. Rumi says, "The past and future belong to Allah; live only in the present." In quantum mechanics, time and space are not fixed in the classical sense and are not in a specific state until observed. Rumi's emphasis on existence beyond time aligns metaphorically with this scientific truth.

III. Rumi's Simurgh Story and Quantum Superposition

In Rumi's Masnavi, the story of Simurgh can be related to the concept of superposition. Simurgh represents both one and many birds at the same time. Superposition describes a particle's ability to exist in multiple states at once. Rumi's Simurgh story conveys that an individual is both unique and part of the whole: "In the Simurgh legend, every bird is Simurgh, and Simurgh is all of them."

IV. Mirrors and Reflections

Rumi frequently uses the mirror metaphor. In quantum physics, the state of particles is determined at the moment of observation, just like a reflection in a mirror appears instantly when we look. "Keep your heart's mirror pure so that the Truth may reflect upon it." This resembles how, in quantum mechanics, the state of particles is defined by the observer. The particle's state "reflects" and becomes determined upon observation.

V. The Dance of the Universe

One of Rumi's most famous metaphors is the depiction of the universe as a dance. In quantum physics, particles are in constant motion and interaction. Rumi says, "The universe is a rotation; everything is interconnected and dances." This statement aligns with the quantum understanding that particles are constantly interacting and moving. In the quantum world, every particle is part of a cycle of energy and motion. The anecdotes and teachings of Mevlana Jalaluddin Rumi bear many parallels with quantum physics on a metaphorical and philosophical level. His themes of the unity of existence, the transcendence of time and space, the mirror metaphor, and the dance of the universe intriguingly intersect with fundamental quantum physics concepts. These parallels may help us better understand both Rumi's profound spiritual insights and the complex realities unveiled by modern science.

Miracles and Quantum Phenomena

The miracles mentioned above are extraordinary events performed by the friends of Allah, known as saints, in Islamic mysticism. Quantum consciousness, on the other hand, is a concept based on the idea that quantum physics may be related to human consciousness. Although these two fields originate from seemingly different disciplines, they share metaphorical and philosophical parallels in some aspects. The miracles of Sufi saints have inspired deep admiration in the Islamic world for centuries. While these miracles are explained through the saints' spiritual depths and closeness to Allah, modern science seeks to examine these extraordinary events from a quantum physics perspective.

Quantum physics is a branch of science aimed at understanding the fundamental building blocks of nature, operating at the smallest scales of the universe. In this context, exploring the relationship between quantum phenomena and the miracles of saints holds the potential to strengthen the connections between the spiritual and scientific realms. One of the most intriguing features of quantum physics is phenomena like superposition and entanglement. Superposition refers to a quantum particle's ability to exist in multiple states simultaneously, while entanglement describes the profound connection between two seemingly independent particles. An effect on one entangled particle instantly affects the other, regardless of the distance between them. These phenomena challenge the deterministic rules we are accustomed to in daily life, reminding us of the universe's mysterious and elusive nature.

The miracles performed by saints are events that are difficult to explain within the framework of classical physics laws. The closeness of Sufis to Allah allows them to connect with spiritual powers and perform events that transcend the physical world. These miracles go beyond the limitations of time and space, defying human comprehension. For instance, miracles like a saint being present in multiple locations simultaneously, healing a disease instantly, or foreseeing the future bear parallels to the phenomena of quantum superposition and entanglement.

The principle of superposition offers an intriguing perspective for explaining miracles such as a saint being in multiple places at once. This phenomenon suggests that the saint, by Allah's permission, may manipulate events occurring at the quantum level, manifesting in the physical world not as a single being but as multiple entities. Considering that in the quantum world, a particle can exist in multiple places simultaneously, it is possible that saints, through their spiritual levels, have attained this state.

The entanglement phenomenon could explain miracles where a saint knows or influences events happening at great distances instantly. Quantum entanglement demonstrates that there can be instant communication between entangled particles, regardless of distance. In this context, the saint's high spiritual level strengthens their connection with Allah and creates a universal entanglement. Through this entanglement, the saint could possess knowledge or influence that is impossible in the physical world.

Such an outlook helps us comprehend the universe's spiritual and material dimensions as a whole by bringing together the profound spiritual wisdom of Sufism and the discoveries of modern science. While quantum physics reveals the mysterious and extraordinary nature of the universe, Sufism opens doors for us to understand the spiritual dimensions of this universe and Allah's

influence on it. The potential relationship between the miracles of saints and quantum phenomena should not remain mere speculation, but rather serve as an opportunity to explore how these two different worldviews complement and enrich one another. Ultimately, the relationship between the miracles of Sufi saints and quantum phenomena is a fascinating and thought-provoking subject that investigates the deep connections between science and spiritual knowledge. The secrets of the universe may lie hidden in both the subtleties of quantum physics and the spiritual depths of Sufism. Exploring the links between these two realms can enrich both our spiritual and scientific knowledge and help us reach a more holistic understanding of how the universe operates.

Extraordinary Events and Quantum Phenomena

Miracles are defined as supernatural events performed by saints. For instance, a friend of Allah may appear in different places simultaneously, know an event that will occur in the future, or move an object in defiance of physical laws. In quantum physics, phenomena such as particles existing in multiple states simultaneously (superposition), instantaneous information transfer (quantum entanglement), and other phenomena unexplained by classical physics are observed. These extraordinary events can be metaphorically linked to the extraordinary phenomena observed in the quantum world. While miracles are seen as manifestations of wisdom and power beyond the physical world, quantum physics investigates mechanisms that operate beyond the rules of classical physics in the fundamental nature of matter and energy.

Consciousness and Observation

It is believed that individuals who perform miracles possess a deep spiritual consciousness and closeness to Allah, which enables them to perform extraordinary events. This consciousness allows them to be aware of the profound truths in the universe and the secrets of Allah. In quantum physics, the role of the observer is important. A particle's state is accepted to become determined when it is observed. This raises interesting questions about how consciousness and observation can influence physical reality. In this context, a metaphorical relationship can be drawn between deep spiritual consciousness in Sufism and the role of the observer in quantum physics. While miracles are seen as manifestations of a high spiritual consciousness, observation in quantum physics is a critical factor that determines the state of particles.

Unity and Connection

In Sufism, saints are regarded as individuals who reflect Allah's light and unity (Vahdet-i Vücut). Their miracles reinforce the belief that everything in the universe is essentially one and operates within a divine order. Quantum entanglement means that two particles remain connected, and the state of one instantly affects the other. This connection is independent of distance and shows a deep unity and connection between particles. The understanding of unity in Sufism carries parallels to

the concept of quantum entanglement. Miracles demonstrate that saints are aware of the universal unity and connection, and through this consciousness, they can perform extraordinary events.

One of the miracles of Somuncu Baba is his ability to be present in different places simultaneously. This can be compared to quantum superposition, where a particle can exist in multiple states simultaneously. The ability of Hz. Khidr to be present in different times and places at once can be metaphorically linked to quantum entanglement or interactions that transcend time and space. Although miracles and quantum consciousness are addressed in different contexts, they carry metaphorical and philosophical parallels in some aspects. While miracles are seen as manifestations of deep spiritual consciousness and Allah's divine grace, quantum physics investigates the fundamental nature of matter and energy and their relationships with consciousness. Both fields encourage us to reflect on the deep connections and extraordinary phenomena in the universe. Therefore, the conceptual relationship between miracles and quantum consciousness deepens both our spiritual and scientific understandings.

CHAPTER 23

REALITY AND COSMIC WISDOM

Quantum Entanglement and the Unity of Existence

Quantum entanglement refers to a phenomenon where two or more particles are deeply connected, regardless of the distance between them. Once these particles are entangled, the state of one instantly affects the state of the other. For instance, when the spin of one particle is measured, the spin of its entangled counterpart is immediately determined. It is as though these particles behave as a single entity. This phenomenon challenges the classical notion of local causality because the interaction appears to occur faster than the speed of light. Entanglement is one of the most mysterious and profound phenomena in quantum mechanics.

Prominent Sufi scholars like Muhyiddin Arabi deeply explored the concept of the Unity of Existence (Vahdet-i Vücut). According to this teaching, there is no true existence other than God. All created beings have no separate existence apart from Him. Quantum entanglement shows how physical entities can be inextricably linked. Just as entangled particles are interconnected, one could say that the entire universe is interconnected within the oneness of God.

Quantum entanglement demonstrates that particles can interact beyond the boundaries of time and space. This suggests that God's existence transcends time and space and that the entire universe moves by His will. The Unity of Existence posits that all beings in the universe are manifestations of the Divine. The parallels between quantum entanglement and the Unity of Existence carry deep meaning both scientifically and spiritually. They reveal the profound unity and connection that God has instilled in the universe.

Sufi thought explains that all beings are a manifestation of God, which aligns with the idea that everything in the universe is interconnected. Quantum entanglement shows that all particles in the universe are fundamentally connected. Reality is a reflection and manifestation of God's existence. The material world is a mere image of this reflection. In quantum theory, the act of observation affects the system's state, indicating that reality is linked to observation and arises as a result of the observer's presence.

Humans must trust in God's will and accept that everything is under His control. Heisenberg's Uncertainty Principle asserts that it is impossible to precisely know both a particle's position and momentum simultaneously. Uncertainty is a fundamental feature of the quantum world. The Unity of Existence teaches that all beings in the universe are manifestations of God and derive from a single essence. In quantum physics, it is believed that the fundamental building blocks of the universe are in constant interaction, forming an inseparable whole. This wholeness symbolizes the unity of the universe. In Sufism, consciousness and spiritual energy are tools used to draw closer to God. In quantum physics, the relationship between energy and consciousness is studied, particularly through quantum consciousness theories. In Sufism, a person's union with God and therefore with the universe is achieved through a spiritual journey. Quantum physics also holds that humans are connected to everything in the universe and are part of it on a subatomic level, which is in harmony with the idea of human-universe integration.

Quantum Eraser and Repentance (Tawba)

The quantum eraser is one of the experiments in quantum mechanics that defies classical intuition. It shows that the past behavior of a particle, such as a photon, can be altered or "erased" by a future measurement. This phenomenon plays a crucial role in understanding the probabilistic nature of quantum mechanics and the role of the observer.

In the double-slit experiment, a particle (such as an electron or photon) can pass through two slits simultaneously. If the arrival points of these particles are observed on a screen without any measurement behind the slits, an interference pattern appears, indicating that the particle behaves like a wave. However, if a measurement is made to determine which slit the particle passed through, the interference pattern disappears, and the particle behaves like a particle. In a version of this experiment, after the photons pass through the slits, the information about which slit they went through is recorded with a "tag." However, in another stage of the experiment, this information can be deliberately "erased." If the information is erased—meaning it is no longer available—the interference pattern reappears as if the information had never been collected. This shows that the past behavior of the particle can be "erased" by a future action.

The quantum eraser experiment challenges the classical linear perception of time. Normally, the outcome of an event follows its cause. However, in this experiment, a future measurement seems to affect the past. In quantum mechanics, this does not create a contradiction due to the nature of probabilities and wave functions, but it challenges our classical understanding of causality. Sufism offers a vision of the universe operating under the absolute power of God, beyond the confines of

time and space. The reshaping of the past by a future choice seen in the quantum eraser experiment reflects, in a Sufi sense, the absolute will of God and the realities beyond human perception. In Sufi teachings, it is believed that every moment is recreated by God and that time itself is a creation of His. In this context, the quantum eraser experiment parallels this Sufi understanding and can be seen as a metaphor for God's absolute will beyond time. The quantum eraser carries deep significance both scientifically and metaphysically, expanding our modern scientific understanding of the universe's workings and offering a new perspective on the concepts of time and creation found in Sufi thought.

Repentance, or Tawba, is an important concept in Islam, expressing the greatness of God's mercy and forgiveness, as sins are erased as if they had never been committed. Connecting this to the idea of time and causality presented in the quantum eraser experiment can deepen both our metaphysical and scientific understanding. According to Islam, when a person sincerely repents, God erases their sins, treating them as if they had never occurred. This implies the complete elimination of the effects of a past action within the linear flow of time. This concept, which appears to contradict the linear progression of time, suggests that time and events can be reshaped by God's will. In the quantum eraser experiment, a particle's past behavior can be "erased" or "altered" by a future action, meaning that the particle's past is reshaped by a future event. Similarly, in repentance, the past sin is erased through a sincere future act of repentance. As in the quantum eraser experiment, the past is rewritten or eliminated through a future action.

The quantum eraser challenges the classical concept of causality, showing that the result of an event can precede its cause, or the effects of an action can be altered by a future choice. This reminds us that God's will and power transcend all physical and temporal limitations. His absolute will exists beyond causality and time. Repentance and the erasure of past sins can be seen as a manifestation of this will. Just as in the quantum eraser experiment, God's will can reshape or eliminate the past. This serves as a reminder of God's absolute control beyond time and space. God's forgiveness can alter not only the future but also the past.

In quantum mechanics, before an event occurs, there are numerous possibilities. However, once an observation or measurement is made, one of these possibilities is established as "reality." Repentance, or tawba, provides humans with the opportunity to reassess their negative choices from the past and remove their consequences through Allah's mercy. In the quantum erasure experiment, a state that has been determined through measurement (such as knowing which slit a particle passed through) can be "erased" by a future choice. Similarly, through repentance, a person's past sins can be erased, and they can make a "clean" new beginning. This can be likened to the second chance Allah grants to people, as the door of repentance is always open. Allah, through sincere repentance, completely erases past mistakes and offers a new beginning. The erasure of past sins through tawba reflects Allah's boundless mercy and will. A deep parallel can be drawn between this and the reflections on time, causality, and possibilities brought forth by the quantum erasure experiment. Both concepts demonstrate that the past is not an absolute, unchangeable thing, but can be reshaped, and that through Allah's will, everything is possible. This holds profound meaning both scientifically and metaphysically, reinforcing faith in Allah's infinite mercy. As the hadith says, "One who repents from a sin is like one who never committed it."

The Command “Be” and the World of Possibilities

The command “Kun” is Allah’s command to “Be!” and through this command, everything comes into existence. This command represents Allah’s creative power and absolute will. At the subatomic level, in the quantum domain, understanding the command “Kun” requires the integration of metaphysical and quantum physics concepts. In quantum physics, matter and energy are not fixed and static entities; rather, they are expressed as waves of possibilities. At the quantum level, the existence of a particle is defined solely by probability waves. The command “Kun” manifests as these probability waves “becoming” or “materializing” into existence. Allah’s command “Kun” is the transformation of possibilities within the quantum potential into a concrete reality. This is also linked to the secret of Be. On the quantum level, which can be seen as an intermediary realm, particles exist in specific energy levels, and a change in these levels is known as a “quantum leap.” This leap occurs suddenly, without being bound to any specific order or timeframe. The command “Kun,” as the instantaneous and absolute effect of a creative power beyond time and space, is realized. In this context, the command “Kun” is one of the metaphysical correspondences of quantum leaps. It must not be forgotten that atomic structures on the quantum level are also fundamental elements that constitute human beings in our world (based on the secret of Be).

On the other hand, quantum entanglement refers to the state where two or more particles are connected, so that the state of one instantly affects the state of the other, no matter the distance between them. In Sufism, the concept of Wahdat al-Wujud (the Unity of Existence) expresses the idea that the entire universe is interconnected and that all beings are one and whole through Allah’s will, linked through the command “Kun.” In this sense, on the subatomic level, the command “Kun” explains how creation occurs at the quantum level, how a reality emerges from among possibilities, and how all beings in the universe are interconnected. “He is the Originator of the heavens and the earth. When He decrees a matter, He only says to it, ‘Be,’ and it is” (Baqarah/117).

Degrees of Existence and Quantum Leaps

In Sufism, particularly in the teachings of Muhyiddin Arabi, the concept of “degrees of creation” (marātib al-wujūd) or “degrees of existence” explains the different levels of beings, starting from the absolute existence of Allah and extending to created beings. These degrees are levels of existence that emerge through the manifestations of Allah’s names and attributes, describing a gradual transition from Allah to beings. In Muhyiddin Arabi’s understanding of Sufism, these degrees are generally examined at five basic levels:

I. Hazrat al-Hahut (The Divine Essence Realm): This is the stage of Absolute Unseen (Ghayb), where Allah’s essence remains absolutely transcendent and beyond the reach of any created being. Allah’s names and attributes have not yet manifested at this stage, which is also referred to as the “Absolute Essence” (Huwiyyat al-Mutlaqa). Muhyiddin Arabi defines this stage as “Zat al-Buht,” a being that is impossible to comprehend or perceive.

II. Hazrat al-Lahut (The Realm of Divine Names): This is the stage where Allah's names and attributes, such as power, knowledge, and will, begin to manifest. At this stage, Allah is known and recognized through His names and attributes.

III. Hazrat al-Malakut (The Spiritual Realm): At this level, Allah's names and attributes manifest in a spiritual form, representing a symbolic realm. Dreams, symbols, and visions are part of this realm, and it is seen as the spiritual source of the physical world.

IV. Hazrat al-Shahadah (The Material Realm): This is the realm of the physical world, where material beings exist. It includes the physical existence of beings within time and space. According to Muhyiddin Arabi, this world is the lowest level of existence, but it is also seen as a reflection of the higher realms.

V. Insan al-Kamil (The Perfect Human Being): This is the being in whom all these levels converge and who represents the perfect manifestation of Allah's names and attributes. According to Muhyiddin Arabi, Insan al-Kamil serves as a bridge between Allah's essence and creation, with the divine manifestations appearing at their highest level.

These levels, in Muhyiddin Arabi's doctrine of Wahdat al-Wujud (Unity of Existence), help us understand the chain of existence that descends from Allah to matter. Each level reflects the one above and serves as the source of the one below. These levels explain the continuous process by which creation emerges from Allah's absolute essence to created beings. Rather than being viewed as completed stages that occurred in the past, these levels are constantly renewed at every moment, expressed as "each moment in a new state." These levels occur at the subatomic quantum level, in what could be called timelessness, where events transpire in fractions of a second so small they are beyond measurement. Thus, the process occurs continuously, like frames in a movie, creating the perception of continuous time. The quantum subatomic level has a discrete structure, and transitions do not follow a continuous path. Unlike our classical understanding of matter and time, the logic of quantum leaps and re-creation applies.

CHAPTER 24

WAVE-PARTICLE AND ZAHIR-BATIN

Quantum Mechanics and the Uncertainty Principle

In quantum mechanics, we have mentioned that Heisenberg's Uncertainty Principle is a fundamental concept. According to this principle, the exact position and momentum (speed) of a particle cannot be determined simultaneously. If you know a particle's position with certainty, its momentum becomes indeterminate, and vice versa. A particle can behave both as a wave and as a particle, but these two forms cannot be observed at the same time. When in wave form, the

particle's characteristics become uncertain, and when in particle form, its wave characteristics become blurred. In the quantum world, this transformation between two different dimensions of existence is a necessity, and this uncertainty reflects an ontological reality.

Sufism and the Zahir-Batin Relationship

In Sufism, Allah's attributes of Zahir (the apparent) and Batin (the hidden) hold great significance. Zahir represents the visible, manifest, and known aspects of Allah's presence and actions, while Batin represents His hidden, unknown, and incomprehensible aspects. In Allah's unity (tawhid), these two aspects coexist, but human perception cannot grasp both simultaneously. When Allah is Zahir, Batin is concealed, and when He is Batin, Zahir becomes imperceptible. This relates to the limitations of human perception and the fact that divine truth operates beyond the human cognitive realm.

In the deep understanding of Sufism, the relationship between Haqq (absolute reality) and halk (creation) also follows a similar dialectic. When Haqq is present, halk appears to be absent, and when halk is present, Haqq is hidden. Allah is the ultimate reality, and all creation is His manifestation. However, humans can only perceive this ultimate reality through His manifestations and creations. In this context, there is no 'duality' between Haqq and halk; it is only human perception that distinguishes between them.

The Relationship Between Quantum Uncertainty and Zahir-Batin

There is an intriguing parallel between the uncertainty principle in the quantum world and the concepts of Zahir and Batin in Sufism. A particle can exist both as a wave and as a particle, but these two forms cannot be observed simultaneously. This is akin to how Allah is both Zahir and Batin, but human perception cannot comprehend both aspects at once. Human perception is limited, and this limitation is a defining factor in both the quantum world and Sufism.

Wave-Particle Duality: Fundamental particles, like electrons, can behave both as waves and particles. However, when one is observed, the nature of the other becomes indeterminate. When observed as a wave, particle characteristics become blurred, and when observed as a particle, wave characteristics cannot be seen clearly. This can be compared to Allah's Zahir (open and known) and Batin (hidden and unknown) attributes. When Allah is Zahir, His Batin aspect is concealed. As humans perceive His creation and manifestations in the universe, they cannot gain clear knowledge of His absolute Batin existence. When the Batin is grasped, Zahir becomes blurred, as the transcendent dimension of Haqq is hidden in its depths.

Haqq-Halk Relationship: In Sufism, Haqq is absolute reality, and halk is what is created. When Haqq is present, halk is 'shadowed,' and when halk is present, Haqq is 'concealed.' This idea mirrors the uncertainty principle in the quantum world. When a particle is in wave form, its particle state cannot be clearly perceived. Similarly, Haqq exists beyond human perception; His manifestations on

creation, appearing as halk, are merely reflections of His ultimate being. However, humans strive to understand Haqq through halk, just as they try to comprehend ultimate reality through its manifestations.

The Concept of Manifestation in Sufism: Allah's manifestations are, in a sense, akin to the uncertain nature of quantum particles. Allah's manifestation as Zahir conceals His Batin nature, and vice versa. Ibn Arabi states that everything in the universe is a manifestation of Allah, but these manifestations do not fully signify His absolute existence. This is similar to how quantum particles exist both as waves and particles, yet human observation cannot fully comprehend their true nature.

Zahir and Batin and the Quantum Measurement Problem

In the quantum world, our inability to simultaneously determine both a particle's position and momentum can be associated with the 'concealment' of the particle's wave function. When we determine the existence of a particle, its wave form becomes blurred, and vice versa, when we observe the wave form, the particle's state becomes indeterminate. This mirrors the relationship between Zahir (visible) and Batin (hidden) in Sufism. When one is revealed, the other is concealed, and when one becomes apparent, the other becomes blurred.

In conclusion, the relationship between quantum mechanics and Sufism reveals a deep unity on both scientific and spiritual levels. The uncertainty between particles and waves in the quantum world presents a parallel reality to the Sufi concepts of Zahir and Batin. The impossibility of simultaneously comprehending Allah's Zahir and Batin attributes and the inability to determine both the position and momentum of a particle serve as reminders of the limitations of human perception and the dimensions of divine truth that lie beyond human understanding. This indicates that everything in the universe has both a visible and an invisible aspect, and shows how quantum physics and Sufism can be profoundly connected.

CHAPTER 25

GLOSSARY OF BASIC CONCEPT IN QUANTUM PHYSICS

Antimatter: Antimatter, in its simplest form, is the opposite of normal matter. The subatomic particles of antimatter have properties that are the opposite of those of normal matter. The electric charges of these subatomic particles are the exact reverse of the subatomic particles in normal matter. Antimatter was formed alongside normal matter after the Big Bang, but it is extremely rare in the universe, and scientists are still uncertain about why this is the case.

Anyons: Particles with half-integer spins that arise in two-dimensional systems.

Alpha Particle: A particle similar to the nucleus of a helium atom, consisting of two protons and two neutrons, released during radioactive decay.

Angular Momentum: A property of rotating objects similar to momentum, connected to their inertia. It equals the speed of rotation around an axis.

Atom: The smallest unit of matter that cannot be chemically divided.

Atomic Weight (Atomic Mass): The total mass of protons and neutrons in an atom's nucleus.

Atomic Number: The number of protons in the nucleus of an atom.

Atomic Orbitals: Mathematical functions that describe the possible positions of electrons around an atomic nucleus.

Binding Energy: The energy that holds protons and neutrons together in the atomic nucleus.

Baryon: A type of hadron composed of three quarks (e.g., protons and neutrons).

Beta Particle: A particle emitted during radioactive beta decay. It is usually an electron, though it can sometimes be a positron. Beta particles are released when a neutron converts into a proton or vice versa in unstable atomic nuclei.

Bell Experiments: Experiments designed to test quantum entanglement and the principles of locality.

Blackbody Radiation: Radiation emitted by a perfect absorber.

Black Hole: A region where gravity is so strong that even light cannot escape.

Bloch Functions: Functions describing the motion of electrons in a crystal lattice in solid-state physics.

Bohr Model: An early atomic model describing the structure of atoms and the energy levels of electrons.

Bose-Einstein Condensate: A state of matter formed by bosons at extremely low temperatures.

Boson: A particle with an integer spin that acts as a force carrier.

Casimir Effect: The attractive force between two close plates caused by quantum vacuum fluctuations.

Complex Numbers: Mathematical structures used in quantum mechanics to define wave functions.

Complex Numbers: Mathematical structures used to define wave functions in quantum mechanics.

Chemical Element: Fundamental substances that are arranged in the periodic table and have the same atomic number.

Charge Conservation: A law stating that the total electric charge does not change over time.

Coherence: The property of wave functions being in the same phase.

Compound: A substance formed by the chemical bonding of two or more elements in specific ratios. Compounds are represented by chemical formulas that indicate the types and proportions of elements present, like water (H_2O), which consists of two hydrogen atoms and one oxygen atom.

Compton Scattering: The scattering of photons by matter, where the photons lose energy.

Coulomb Force: The force of attraction or repulsion between electrically charged particles.

Collision: An event in which particles interact with each other.

Dark Energy: An unknown form of energy that accelerates the expansion of the universe.

Davisson-Germer Experiment: An experiment that demonstrated the wave nature of electrons.

Degeneracy: The condition where multiple quantum states share the same energy level.

$E=mc^2$: Einstein's equation in relativity, stating that energy is proportional to mass multiplied by the square of the speed of light.

Electromagnetic Radiation: A natural phenomenon arising from the interaction of electric and magnetic fields. Depending on wavelength, frequency, and energy, electromagnetic radiation exhibits different characteristics and travels as energy packets called photons, showing both wave and particle properties.

Electron: A negatively charged subatomic particle that orbits the atomic nucleus.

Electron Cloud: The area representing the probable locations of electrons around an atom.

Electron Configuration: The arrangement of electrons within an atom.

Electronvolt (eV): A unit of energy equivalent to the energy gained by an electron when passing through a one-volt potential difference.

Element: A simple chemical substance made up of atoms with the same number of protons, having the same chemical properties. Each element is identified by its atomic number in the periodic table, such as carbon, oxygen, and hydrogen.

Energy Bands: Allowed energy levels for electrons in solids.

Energy Levels: The specific levels of energy that electrons can occupy within an atom.

Entropy: A measure of disorder or information in a system.

Fermilab: A leading particle physics research laboratory in the U.S., named after physicist Enrico Fermi. Known for its experiments using high-energy particle accelerators, Fermilab contributed to discoveries like the Higgs boson.

Fermi Energy: The maximum energy of electrons at the Fermi level.

Fermion: A particle with half-integer spin, fundamental to the makeup of matter.

Fermionic Condensation: The dense matter state formed by fermions at extremely low temperatures.

Fission: The process of splitting a heavy atomic nucleus into smaller particles, releasing large amounts of energy.

Fusion: The process in which light atomic nuclei combine under extreme heat and pressure to form a heavier nucleus, releasing more energy than fission.

Gamma Radiation: A high-energy form of electromagnetic radiation released during various processes, including radioactive decay.

Gluons: The particles responsible for the strong interaction between quarks, akin to the role of photons in electromagnetism.

Gravitation: The force of attraction between masses, as defined by Newton.

Gravitational Force: The attractive force between masses, defined by the law of universal gravitation.

Hadron: Particles made of quarks, interacting through the strong nuclear force.

Hamiltonian: The operator representing the total energy of a system.

High Energy Physics: A branch of physics that studies the behavior of very high-energy particles.

Heisenberg Uncertainty Principle: The principle that the position and momentum of a particle cannot both be precisely known at the same time.

Higgs Boson: The particle that interacts with the Higgs field, giving mass to other particles.

Holographic Principle: A principle that relates the information content of the universe to its surface area.

Interference: The interaction of waves as they travel different paths, resulting in patterns.

Ion: An atom or molecule that has gained or lost electrons, acquiring a charge.

Ionization Energy: The energy required to completely remove an electron from an atom.

Isotope: Atoms of the same element with differing numbers of neutrons.

Incompressible: The process of creating a copy of a particle in superposition is the operation of generating a copy of the same superposition state of a particle that exists in quantum mechanics. However, according to the principles of quantum mechanics, it is generally not possible to fully copy or replicate the superposition state of a particle. This is particularly complicated due to the

effects of uncertainty and measurement operations. Superposition states represent a particle's presence in multiple possible states simultaneously, and directly copying this state challenges the limits of quantum theories.

Lepton: Light particles that interact via the weak nuclear force (e.g., electrons, muons, neutrinos).

LHC (Large Hadron Collider): The world's largest particle accelerator, located at CERN.

Magnetic Field: The area created by the movement of electric charges, where magnetic forces are effective.

Magnetic Atom: An atom that produces a magnetic moment due to the spins or orbital movements of its electrons. Such atoms can interact with magnetic fields and constitute the fundamental components of magnetic materials. For example, metals like iron, nickel, and cobalt have magnetic atoms.

Magnetic Moment: A vector that describes a particle's interaction with a magnetic field.

Magnetism: A natural phenomenon arising from the movement of electric charges, encompassing the study of magnetic fields and magnetic forces. The magnetic field created around a magnet is one of the most common examples of magnetism.

Mass Number: The total number of protons and neutrons in the nucleus of an atom.

Max Planck: Planck developed Quantum Theory and worked on thermodynamic laws. He discovered the constant known as Planck's constant and Planck's radiation law. The quantum theory he proposed was revolutionary and groundbreaking among the known physical laws of his time.

Maxwell's Equations: Equations that describe the classical theory of electromagnetic fields.

Molecule: Structures formed by the combination of atoms through chemical bonds.

Momentum: A vector quantity obtained as the product of an object's mass and its velocity.

Muons: A type of lepton that is heavier than electrons.

Niels Bohr: Developed the Bohr model of the atom, proposing that the energy levels of electrons are discrete and that electrons orbit the atomic nucleus in stable orbits but can jump from one energy level (or orbit) to another.

Nucleus: The central region of an atom, consisting of protons and neutrons

Noether's Theorem: The relationship between symmetries and conservation laws.

Noether's Theorem: A theorem explaining the connection between symmetries and conservation laws.

Neutrino: Nearly massless and nearly undetectable particles that interact via the weak nuclear

force.

Neutron: A neutral subatomic particle found in the atomic nucleus.

Neutron Star: A dense star composed of neutrons, left behind after a supernova explosion.

Nuclear Energy: Energy released from the splitting (fission) or merging (fusion) of atomic nuclei. This energy is used in applications such as electricity generation in nuclear reactors.

Orbital Hybridization: The process of atomic orbitals combining to form new hybrid orbitals.

Orbital: The paths followed by electrons around the nucleus.

Orbital Shell: The region surrounding an atomic nucleus where electrons are found. The size of an orbital determines the energy of the electrons located there.

Particle Manipulation: The process of controlling and arranging the properties, states, or movements of subatomic particles. This process uses various methods and tools to change the speed, direction, energy, or other physical characteristics of particles.

Pauli Exclusion Principle: No two fermions can occupy the same quantum state.

Photonics: The science related to the manipulation and use of photons.

Planck Length: The scale of length where quantum gravitational effects become significant.

Planck Constant: A fundamental constant in quantum mechanics.

Photon: The quantum of light, the fundamental particle of light, and the carrier of electromagnetic force.

Proton: A positively charged subatomic particle found in the atomic nucleus.

Proton-Proton Chain: A reaction chain that occurs during the transformation of hydrogen into helium in stars.

Quark: Fundamental particles that make up hadrons.

Quantum: Packets of energy or matter.

Quantum Field Theory: A theoretical framework that combines quantum mechanics and special relativity.

Quantum Entanglement: The condition where the quantum states of two or more particles are interconnected.

Quantum State: All properties of a particle, such as its energy level and position.

Quantum Electrodynamics (QED): A quantum theory that studies the interactions between electrons and photons.

Quantum Corrosion: The wear caused by quantum particles attacking surfaces.

Quantum Chromodynamics (QCD): A quantum theory that studies the interactions between quarks and gluons.

Quantum Mechanics: The fundamental theory that describes the behavior and interactions of particles at the microscopic level. It works with concepts such as wave functions and probability amplitudes.

Quantum Jump: The sudden transition of an electron from one energy level to another.

Quantum Tunneling: The phenomenon where a particle overcomes an energy barrier that it normally would not be able to cross.

Quantum Time Delay: The time interval between measurements in quantum systems.

Quark: One of the building blocks of particles known as hadrons. Quarks make up baryons (like protons and neutrons) and mesons (such as pions).

Qubit: The fundamental unit of information in quantum computers, analogous to bits in classical computers. While a classical bit can take a value of either 0 or 1, a qubit can exist in both 0 and 1 values simultaneously according to the principles of quantum mechanics. This property is known as superposition.

Radioactive Decay: The process by which an unstable atomic nucleus emits energy and particles (alpha, beta, or gamma rays) to transform into a more stable nucleus. This process occurs over time by a naturally radioactive material.

Radioactivity: The phenomenon of unstable atomic nuclei breaking apart and emitting energy.

Rutherford Model: An atomic model proposing that most of the atom is empty space and that the nucleus is made up of positively charged protons.

Rydberg State: An atomic state in which an electron is at a very high energy level.

Speed of Light: The speed at which light travels in a vacuum, approximately 299,792,458 meters per second.

Schrödinger Equation: A fundamental equation that describes the wave function of a particle in quantum mechanics.

Solvay Conferences: Famous conferences where quantum mechanics and other physical topics were discussed.

Superconductivity: The state of certain materials at very low temperatures where electrical resistance is zero.

Superposition: The condition in which a particle can exist in multiple states simultaneously.

Spin: The angular momentum possessed by subatomic particles as they rotate around their axes.

Spin-Orbit Interaction: The interaction between a particle's spin and its orbital angular momentum.

Standard Model: A theory that explains the behavior of fundamental particles and forces.

Strings: In string theory, fundamental particles are defined as one-dimensional strings rather than point particles.

Supersymmetry: An extension of string theory that predicts not only fundamental particles through the vibrations of strings but also the existence of a symmetry called supersymmetry. This theory encompasses the idea that every particle has a supersymmetric partner, aiming to explain the fundamental structure of the universe more comprehensively by combining string theory with supersymmetry.

Spectral Lines: Lines observed in the emission or absorption spectra of atoms or molecules.

Shadow Matter: A type of matter proposed in some physical theories, interacting little or not at all with normal matter but present in the universe and detectable through its gravitational effects.

Single-Particle Double-Slit: An experiment in quantum mechanics that demonstrates a single particle behaving like a wave and exhibiting a probability distribution in a double-slit apparatus.

TCP Theorem: A fundamental principle in quantum field theory related to parity, charge, and time reversal symmetries.

Theory of Relativity: Einstein's theory proposing that time and space change relative to the motion of the observer.

Thermodynamics: A branch of physics that studies the relationships between energy and matter, particularly focusing on heat, work, temperature, and energy transformations. Thermodynamics explains how energy exchange occurs in nature and fundamental principles such as the conservation of energy.

Tunneling: The phenomenon where a particle passes through an energy barrier that it normally could not cross, moving to another region.

Time Dilation: The phenomenon where time slows down for an object as its speed increases, according to the theory of relativity.

Time Crystals: Systems that change periodically over time.

Time Travel Paradox: The concept involving a person traveling back to the past.

Time Travel Paradox: A concept that describes situations where a person can travel back in time and alter past events, creating contradictions in their own existence or future. The most well-known example is the "grandfather paradox," where a person travels back in time to kill their grandfather, thereby making their own birth impossible.

Uncertainty Principle: A principle proposed by German physicist Werner Heisenberg in 1927, stating that the position and momentum of an object cannot both be measured exactly, even in theory, at the same time. The uncertainty principle is one of the main features distinguishing quantum mechanics from classical physics.

Vacuum Fluctuations: Energy fluctuations in the vacuum state in quantum field theory.

Vacuum Energy: Energy present in empty space.

Valence Electron: Electrons located in the outermost shell of an atom that form chemical bonds.

Vector: A mathematical object that has both magnitude and a specific direction. Many quantum properties are described in vector terms.

Weyl Fermion: A type of massless fermion that can be observed in condensed matter systems.

W and Z Bosons: The carrier particles of the weak nuclear force.

Wave-Particle Duality: The concept that particles can exhibit both wave-like and particle-like properties.

Wave Function: A mathematical function that describes the wave properties of particles.

Wave Interference: The interaction of wave functions, where they either amplify or diminish each other.

Weak Force: A fundamental force responsible for certain nuclear processes, such as beta decay.

X-ray: A type of high-energy electromagnetic radiation.

Zeno's Paradox: One of the paradoxes proposed by the ancient Greek philosopher Zeno, which argues that motion is impossible.

CHAPTER 26

CONTRIBUTORS TO QUANTUM PHYSICS

Below are the key scientists who played important roles in the development of quantum physics and contributed to its guiding theories:

Albert Einstein: Developed the Photoelectric Effect Theory, which is a fundamental contribution to quantum physics. This theory predicts that light behaves as particles (photons) and that these photons can dislodge electrons from a surface. This discovery facilitated the early development of quantum mechanics and earned Einstein a Nobel Prize. He is also known for his criticisms of

fundamental issues in quantum mechanics; his statement, "God does not play dice," indicates his belief that quantum theory is incomplete.

Andrei Sakharov: Conducted significant studies on quantum electrodynamics (QED). His theory, known as "Sakharov's Graphite," helped improve the understanding of interactions between particles. He also made discoveries related to cosmic microwave background radiation and explored its implications in cosmology.

Anton Zeilinger: A scientist recognized for his pioneering work in quantum mechanics and specifically in quantum information theory. Zeilinger's studies have played a vital role in experimentally verifying complex quantum phenomena like quantum entanglement and have significantly contributed to the development of quantum information theory.

Arnold Sommerfeld: Expanded on Bohr's atomic model, enabling a more precise understanding of atomic spectra. A significant figure in quantum mechanics and atomic theory, Sommerfeld conducted research on spin and magnetic properties. He also made contributions to expanding the mathematical foundations of quantum mechanics.

Carl Wieman: Known for his work on Bose-Einstein condensation. In 1995, he experimentally observed this state for the first time by cooling rubidium atoms to extremely low temperatures alongside Eric Cornell. This achievement opened a new field of research in quantum mechanics and atomic physics.

David Bohm: Developed an alternative interpretation of quantum mechanics known as "Bohmian Mechanics." This interpretation suggests that particles must follow specific paths and that quantum systems can be explained in a more deterministic manner. Bohm's work has provided a different perspective on understanding quantum mechanics.

Enrico Fermi: Made significant contributions to quantum mechanics and nuclear physics. Fermi's work has played a critical role in understanding nuclear reactions and quantum mechanical systems. His statistical mechanical theory, known as "Fermi-Dirac Statistics," is a fundamental tool for understanding the behavior of fermions.

Erwin Schrödinger: Developed the Schrödinger Equation, which forms the mathematical foundation of quantum mechanics. This equation describes the quantum state of a particle and determines how it evolves over time. Schrödinger's work has been crucial in the development of quantum mechanics theory.

Frank Wilczek: Known for his studies on strong interactions and quantum chromodynamics (QCD). QCD is a theory that explains the interactions between quarks and gluons. Wilczek's work has expanded our understanding in particle physics and quantum mechanics.

Georg Wilhelm Friedrich Hegel: While not directly contributing to quantum mechanics or the philosophy of science, Hegel has influenced the philosophical foundations and interpretations of quantum mechanics. Hegel's dialectical method has contributed to philosophical analyses of quantum mechanics.

Hermann Weyl: Made significant contributions to the mathematical structure of quantum mechanics. His work in group theory and differential geometry has strengthened the mathematical foundations of quantum mechanics.

Hugh Everett III: Developed the "Many-Worlds Interpretation" of quantum mechanics. This interpretation posits that every quantum measurement occurs in parallel universes that encompass all possible outcomes. This approach has helped expand the fundamental interpretations of quantum mechanics.

James Clerk Maxwell: The theory of electromagnetism is one of the cornerstones of quantum electrodynamics. Maxwell's equations describe the behavior of electric and magnetic fields and provide a crucial foundation for understanding quantum electrodynamics.

John Archibald Wheeler: Made significant contributions to quantum information and black holes. His work on "Quantum Geometry" and "Quantum Information" has helped relate quantum theory to broader concepts. Wheeler is also the first scientist to use the term "black holes."

John Bell: The Bell Theorem showed that local hidden variable theories, one of the fundamental principles of quantum mechanics, are inadequate for explaining some phenomena predicted by quantum mechanics. This theorem reveals that phenomena such as quantum entanglement challenge classical physics and demonstrate the existence of "non-local" properties inherent in quantum mechanics.

Karl Pribram: An American neuroscientist known for his work on brain functions and consciousness. He is best known for his holographic brain theory, which suggests that the brain stores and processes information like holograms, meaning each piece can contain the entire information. Pribram's studies have made important contributions to understanding how the brain processes information and how memory is organized.

Kenneth Wilson: An American theoretical physicist known for his work on renormalization group theory. This theory particularly pertains to critical phenomena and phase transitions. Wilson's work has revolutionized the understanding of phase transitions in thermodynamics and quantum field theory, enabling the scaling of complex systems and the study of multi-scale structures.

Louis de Broglie: Developed the concept of wave-particle duality. The de Broglie Wave Hypothesis posits that particles have a specific wavelength, which changes based on their motion. This idea is a significant concept underlying quantum mechanics.

Max Born: Developed the probability interpretation in quantum mechanics. Born's rule provides a fundamental method for calculating the probabilities of observations in a quantum system. This approach is a crucial tool for understanding the experimental results of quantum mechanics.

Max Planck: Developed Planck's Law of Blackbody Radiation, which marks the beginning of quantum theory. Planck's work predicted that radiation comes in specific "quanta" of energy. This discovery laid the groundwork for quantum physics.

Muhammad Abdus Salam: Known for developing the electroweak theory, which unifies

electromagnetic and weak nuclear forces. Salam was the first scientist from the Islamic world to win a Nobel Prize, and his work in modern physics has made significant contributions to areas such as quantum field theory.

Niels Bohr: Laid the foundation of quantum mechanics by developing the atomic model. The Bohr Model of the atom uses quantum mechanical rules to explain the energy levels of atoms and their light spectra. Bohr's work is a significant milestone in the development of quantum mechanics theory.

Paul Dirac: Developed the Dirac Equation, which unifies quantum mechanics and special relativity. This equation predicts the spin property of electrons and antimatter. Additionally, Dirac's contributions strengthened the mathematical foundations of quantum mechanics.

Richard Feynman: Made significant contributions to quantum electrodynamics (QED) and developed Feynman Diagrams. He also introduced the path integral formulation in quantum mechanics, making calculations more understandable and manageable.

Satyendra Nath Bose: Recognized for Bose-Einstein statistics and Bose-Einstein condensation in the field of quantum physics. These contributions explained the behavior of subatomic particles at the quantum level and formed the foundations of modern physics.

Stephen Hawking: His most significant contribution to quantum physics is proposing that black holes can emit heat through quantum mechanics, a phenomenon he named "Hawking Radiation." This discovery implies that black holes are not entirely dark and infinitely dense; instead, they can evaporate over time due to quantum effects. This idea is an important step in unifying quantum mechanics with general relativity.

Thomas Young: His most significant contribution to physics is the double-slit experiment, which supports the wave theory of light. This experiment demonstrated that light exhibits both wave and particle properties, laying the groundwork for quantum physics. Young also made significant discoveries in optics through his work on color theory and the human eye.

Werner Heisenberg: He established the foundations of quantum mechanics and is best known for his Uncertainty Principle, which asserts fundamental limits on measuring pairs of complementary variables. His work has profoundly influenced the field of quantum mechanics.

Wolfgang Pauli: He formulated the Pauli Exclusion Principle. This principle states that no two fermions can occupy the same quantum state and has played a fundamental role in understanding the structures of atoms.

CONCLUSION

THE MYSTERIES OF QUANTUM AND INFINITE POSSIBILITIES

Our journey into the magical world of quantum is a discovery that challenges the boundaries of science and allows us to understand the fundamental nature of the universe. The wide range, from the behavior of subatomic particles to the mysteries of black holes, demonstrates how deep and complex the secrets of quantum physics are. The disconnect between general perception and quantum perception is at the center of this new understanding, and overcoming this gap continues to be one of the greatest challenges in science and philosophy. Fundamental concepts like wave-particle duality, the uncertainty principle, superposition, and quantum tunneling have shown us that the universe has a much deeper structure beyond what is visible. Understanding how electrons, photons, and other subatomic particles move is a way to question not only science but also humanity's place in the universe.

From the beginning of our book, we discovered that quantum physics is not just a scientific discipline but also offers a universal perspective. The interactions between bosons, known as social particles, and fermions, the antisocial particles, have been studied as part of this universal order. Conservation laws, concepts like momentum and $E=mc^2$, define the fundamental rules that apply at every point in the universe, while cosmic phenomena like black holes, dark matter, and dark energy reveal that quantum physics encompasses not only the microscopic world but also cosmic scales. The contributions of great thinkers like Einstein, Bohr, Schrödinger, and others have laid the foundations of this new understanding; when combined with concepts like the expansion of the universe, the Big Bang, and the theory of everything, they once again demonstrate how immense and complex the universe is.

The quantum world may seem like a game where we must constantly roll dice, different from the classical world; however, this game offers us a key to unlock the secrets of the universe. At the end of this book, we have shared this key with you as a reader and taken you a step further into the world of quantum filled with infinite possibilities. At this point, it is time to consolidate what we have learned and deepen our thoughts. The secrets offered by quantum are not only a scientific understanding but also lead to a deeper inquiry about life, the universe, and existence itself. Opening the doors to this magical world was the first step into the depths of the universe; now it is up to us to expand this understanding and apply these new perspectives in every moment of our lives.

This work is not only a scientific discovery but also a spiritual and mystical exploration. Islamic mysticism, particularly Sufism, develops an understanding that bears deep and surprising similarities to quantum physics. While the teachings of Sufism focus on the unity of existence and the interconnectedness of all things, quantum physics presents a world where particles are similarly interconnected. In this book, we have presented both a scientific and spiritual exploration by locating ourselves at the intersection of these two fields. We have seen that understanding the elusive nature of quantum physics and its spiritual reflections is an important step in the search for answers to existential questions. As we expand our knowledge of the fundamental nature of the universe, we also enter a process of spiritual enlightenment. This journey takes on meaning not only as a scientific discovery but also as a process of spiritual awakening.

We must be able to look at humanity, the universe, and all created beings holistically, trying to perceive the whole with insight. Since the beginning of human existence, this description has been explained in different ways and efforts have been made to convey it to humanity in various forms. We must perceive this concept in one way or another. Otherwise, we cannot overlook the possibility that all individual efforts made as humanity could lead to the end of society. Despite all this technological advancement and progress, humanity, unfortunately, can still do nothing but cut the branch it sits on. It is evident that unless we renew our perspective on the universe and humanity, we are forced to move toward this bitter end. In other words, as long as humanity continues to perceive the universe and all creatures as separate and disconnected and sees all of this as a clock operating within a mechanical order, it is unfortunately impossible to produce solutions and make healthy evaluations. The solution lies in being able to recognize the holistic relationships and communication networks that exist throughout the universe, shared knowledge, and the phenomena of collective consciousness and awareness. This will only be realized through reading, researching, thinking, analyzing, and observing.

When the universe (subatomic particles) is observed, it materializes. Like a man who turns everything he touches to gold... Apparently, it is the will of the Almighty Creator, who wishes to be known; the creation of humanity and the observation of the universe by the observing human (the vicegerent) declaring "Eşhedü ..." (I bear witness that...) by observing the universe is intended to measure and evaluate everything, thus gaining existence and enabling the bestowal of existence.

AUTHOR

Yalkın Tuncay is a researcher and author, born in 1966 in Ankara. He held senior positions in the finance sector and worked as an executive for companies based abroad. He founded several charitable and personal development associations. His articles and essays have been published in various media outlets. He has hosted exhibitions on calligraphy and painting. His research and books cover a wide range of topics, including quantum physics, Sufism, mystical astrology, the power of thought, and metaphysics. He is married and has three children.

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