

# From Atomic Structure to the Dream World: Exploring the Unknown Dimensions of Life and Consciousness

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**ABSTRACT** Modern science establishes that the human body is fundamentally composed of atomic structures. As the basic units of matter, atoms form cells, tissues, and organs through intricate combinations and interactions, sustaining vital life processes. At the microscopic level, atomic types, quantities, and chemical bonding patterns determine the diversity of biological substances and the complexity of physiological functions. For instance, the unique chemical properties of carbon enable the formation of diverse organic molecules, serving as the foundation of life, while oxygen atoms play a crucial role in energy metabolism during respiration.

**Keywords** Atomic Structure; Multi-dimensional Heterogeneous Space; Atomic Memory; Multi-dimensional Space of Dreams.

## I. INTRODUCTION

### 1.1 Research Background

Modern science recognizes that the human body is fundamentally composed of atomic structures. Atoms, as the building blocks of matter, combine and interact to form cells, tissues, and organs, thereby sustaining essential biological functions. The diversity of biological substances and the complexity of life processes are determined by the types, quantities, and bonding patterns of atoms. For example, carbon atoms exhibit unique chemical properties that enable them to form a vast array of organic molecules, providing the basis of life. Meanwhile, oxygen atoms participate in cellular respiration, playing a critical role in energy metabolism. Reincarnation, an ancient and enigmatic concept, is deeply rooted in various cultural and religious traditions. Eastern philosophies such as Buddhism and Hinduism, as well as certain Western mystical beliefs, propose that life undergoes rebirth in different forms, with the soul or consciousness persisting across lifetimes. Although reincarnation remains scientifically unverified, research continues to explore its plausibility. Some studies investigate children's past-life memories, with reports suggesting that certain individuals recall specific details about past lives and death experiences, prompting deeper inquiries into consciousness and its continuity beyond physical existence [1, 2].

Dreams also remain an area of profound mystery. Throughout history, diverse cultures have sought to

interpret dreams and their symbolic meanings. Contemporary science attributes dreams to brain activity during sleep, linking them to subconscious processes, memory, and emotional regulation [3]. However, certain dream phenomena — such as temporal and spatial distortions or surreal experiences — elude complete explanation by existing scientific theories. Advances in quantum mechanics introduce novel perspectives, suggesting potential links between dreams and quantum phenomena, including entanglement and multi-dimensional space. These perspectives raise intriguing questions about the relationship between atomic structures, consciousness, and dreams.

The seemingly disparate concepts of atoms, consciousness, reincarnation, and dreams may share deeper interconnections. Consciousness, as a fundamental and complex cognitive function, remains a significant scientific challenge. At the atomic level, neuronal activity in the brain involves extensive physical and chemical interactions among atoms and molecules. The relationship between these microscopic processes and the emergence of consciousness warrants further investigation. If reincarnation exists, consciousness plays a pivotal role in this process, with atoms serving as the fundamental carriers of both the body and cognition. Likewise, dreams — manifestations of consciousness during sleep — might act as a bridge between physical reality and other dimensions of consciousness. Understanding the atomic interactions

underpinning these phenomena could offer valuable insights into the nature of life, consciousness, and the universe. Exploring the potential connections between atomic structures, consciousness, reincarnation, and dreams not only advances scientific and philosophical inquiry but may also provide new frameworks for addressing longstanding existential questions [4, 5].

### 1.2 Research Objectives and Significance

This study aims to explore the possible connections between atomic memory, reincarnation, and the relationship between dreams and multi-dimensional space. By adopting an interdisciplinary approach that integrates physics, biology, psychology, and philosophy, the research seeks to uncover the underlying scientific principles and philosophical implications of these phenomena. Specifically, the study investigates atomic memory to determine whether specialized atomic structures play a role in memory storage and transmission, examining their potential involvement in life continuity and consciousness inheritance. This inquiry could provide novel insights into the mechanisms of memory and cognition in both life sciences and cognitive neuroscience [6].

Regarding reincarnation, the study examines scientific evidence and theoretical perspectives to assess its feasibility. By analyzing potential links between reincarnation, atoms, and consciousness, the research seeks to contribute to ongoing philosophical debates about the origins of life, death, and rebirth, offering new perspectives on the nature of existence. Additionally, by analyzing dreams in the context of multi-dimensional space, the study aims to elucidate the physical and psychological foundations of temporal and spatial distortions and surreal experiences within dreams. It explores whether dreams serve as potential gateways to different dimensions of consciousness and examines their broader implications for human cognition and perception.

Understanding these interrelated phenomena carries both academic and practical significance. In medicine, deeper insights into consciousness and memory may facilitate advancements in treatments for neurological disorders and mental health conditions [7]. In psychology, research on dreams and consciousness can provide new theoretical and therapeutic approaches for psychological counseling and psychotherapy. In philosophy, the study of life and consciousness can enrich human perspectives on existence and self-awareness. By fostering interdisciplinary collaboration, this research aims to stimulate academic discourse, inspire further investigations into these enigmatic phenomena, and contribute to a more comprehensive scientific and philosophical framework for understanding consciousness and reality.

### 1.3 Research Methods and Innovations

This study primarily employs a literature research approach. By extensively reviewing relevant literature across multiple disciplines — including physics, biology,

psychology, and philosophy—it systematically explores the research landscape and theoretical advancements related to atomic structure, memory mechanisms, the nature of consciousness, reincarnation phenomena, and the relationship between dreams and multidimensional space. This comprehensive analysis provides a robust theoretical foundation for the study. Through an in-depth examination of academic journals, books, research reports, and other scholarly sources from both domestic and international research communities, this study synthesizes previous research methods, experimental findings, and theoretical perspectives. It identifies existing research gaps and areas requiring further exploration, thereby informing the direction and methodology of subsequent investigations. The case analysis method is also a crucial component of this study. By collecting and examining specific cases related to atomic memory, reincarnation, and dreams—such as documented instances of children's past-life memories, dream analysis cases, and relevant scientific experiments—the study seeks to uncover underlying patterns and connections [8, 9]. It conducts detailed analyses of children who claim to recall past lives, evaluating the details of their accounts, the authenticity and reliability of these memories, and their potential links to atomic and consciousness theories. Additionally, it examines representative dream cases to explore the interweaving of time and space, symbolic meanings, and possible correlations with multidimensional space. Interdisciplinary integration is a key innovation of this study. By transcending traditional disciplinary boundaries, it integrates atomic structure and quantum mechanics from physics, life origin and evolution theories from biology, consciousness and dream research from psychology, and philosophical inquiries into life and existence. This multidimensional approach enables a deeper exploration of the intricate relationships among atoms, consciousness, reincarnation, and dreams. By leveraging insights from diverse fields, this study introduces novel perspectives and methodologies for addressing complex scientific and philosophical questions. Furthermore, this research examines abstract concepts such as atomic memory, reincarnation, and the interrelation between dreams and multidimensional space from a unique perspective. It posits that certain atoms may possess memory-like properties, linking this hypothesis to consciousness continuity and reincarnation phenomena, thereby offering a fresh framework for understanding life's mysteries. Moreover, it applies quantum mechanics and multidimensional space theory to elucidate surreal dream experiences and the spatiotemporal distortions observed in dreams, broadening the scope of dream studies. By constructing a theoretical model interconnecting atoms, consciousness, reincarnation, and dreams, this study aims to reveal potential mechanisms underlying these enigmatic phenomena, contributing an innovative theoretical foundation for future research.

## II. Atomic Structure and Human Body Composition

### 2.1 Basic Composition of Atoms

As the fundamental building blocks of matter, atoms encapsulate the mysteries of the microscopic universe. They are primarily composed of protons, neutrons, and electrons. Protons carry a positive charge, while neutrons are electrically neutral. Together, they form the atomic nucleus, which, despite its minuscule volume, contains almost all of an atom's mass. This configuration is analogous to the solar system, where the sun, occupying only a fraction of the system's volume, dominates its gravitational and mass distribution. For instance, a hydrogen atom's nucleus consists of a single proton, whereas an oxygen atom's nucleus contains eight protons and eight neutrons. The unique physical and chemical properties of different elements arise from variations in their proton and neutron numbers. Electrons, which carry a negative charge, orbit the atomic nucleus at high velocities within an expansive electron cloud. Their motion is not arbitrary but rather follows defined energy levels, known as electron shells, which are designated as K, L, M, N, O, P, and Q from the innermost to the outermost shell. Electrons in shells closer to the nucleus possess lower energy levels, whereas those in outer shells exhibit higher energy states. This hierarchical energy distribution governs electron behavior and chemical reactivity. For example, a hydrogen atom's single electron resides in the K shell, the lowest energy state. In contrast, a carbon atom, with six electrons, distributes two in the K shell and four in the L shell. The electron configuration across different shells determines an element's chemical properties and reactivity. Electron movement outside the nucleus exhibits quantized characteristics, meaning electrons occupy discrete energy levels described by quantum numbers. When electrons transition between energy levels, they absorb or emit photons of specific energies—a phenomenon that manifests in atomic spectra. The study of atomic spectra provides valuable insights into atomic structure and electron dynamics, enabling a deeper understanding of quantum behavior. The stability of an atom hinges on the balance between protons and neutrons in its nucleus. When this balance is maintained, the atom remains stable; however, an imbalance can lead to nuclear decay, during which the nucleus releases particles or electromagnetic radiation to achieve stability. Radioactive elements possess inherently unstable nuclei that spontaneously decay. For instance, uranium-238 undergoes a series of decay processes, ultimately transforming into lead-206. Such radioactive decay plays a crucial role in various scientific and technological applications, including geological age dating and nuclear energy production.

### 2.2 The Role of Atoms in the Human Body

Atoms form the fundamental building blocks of human cells, tissues, and organs, playing a vital role in physiological functions [10]. Carbon, a core element in

biological molecules, possesses unique chemical properties that allow it to form covalent bonds with other atoms, creating long chains or ring structures. These structures provide the backbone for various organic molecules essential to life. In the human body, macromolecules such as proteins, nucleic acids, carbohydrates, and lipids all rely on carbon as their foundational unit. Proteins, the primary functional molecules of life, consist of amino acids linked by peptide bonds. These polypeptide chains fold into complex structures that perform critical physiological functions, including metabolism, immune defense, and signal transduction. Hydrogen atoms are equally indispensable, particularly as key components of water molecules. Water serves as the body's universal solvent, facilitating numerous biochemical reactions and the transport of substances. Additionally, hydrogen plays a crucial role in acid-base balance, helping maintain physiological homeostasis. During cellular respiration, hydrogen atoms participate in redox reactions, aiding in energy production. As glucose undergoes oxidation, hydrogen atoms are gradually released and combine with oxygen to form water, releasing energy that is stored as ATP—powering cellular activities.

Oxygen atoms are central to respiration, a process essential for energy production. Oxygen is inhaled and transported via the bloodstream to cells, where it participates in mitochondrial respiration. There, it combines with hydrogen atoms, forming water and releasing substantial energy in a process known as aerobic respiration. This mechanism is the primary means by which the human body derives energy to sustain life. Oxygen deficiency can severely impact cellular energy production, leading to physiological dysfunctions. For example, at high altitudes where oxygen levels are lower, individuals may experience hypoxia, resulting in symptoms such as breathlessness, dizziness, and fatigue. Nitrogen atoms are fundamental to proteins and nucleic acids. In proteins, nitrogen is present in amino groups, forming peptide bonds that link amino acids into complex structures. This structural complexity enables proteins to carry out a wide range of biological functions. In nucleic acids (DNA and RNA), nitrogen atoms form the bases adenine (A), guanine (G), thymine (T), cytosine (C), and uracil (U). These bases establish hydrogen bonds, shaping the double-helix structure of DNA and the single-stranded structure of RNA, thus encoding and transmitting genetic information. This information guides biological processes such as growth, development, inheritance, and evolution.

Beyond these primary atoms, trace elements—including iron, zinc, selenium, and iodine—play crucial physiological roles despite their relatively low concentrations. Iron is a key component of hemoglobin, facilitating oxygen transport from the lungs to body tissues. Iron deficiency can lead to anemia, manifesting as pallor, fatigue, and dizziness due to impaired oxygen delivery. Zinc contributes to enzymatic

functions, immune responses, and reproductive health. In children, zinc deficiency can cause growth retardation and weakened immunity, while in adults, it may affect fertility and skin integrity. Selenium functions as an antioxidant, protecting cells from free radical damage, enhancing immune function, and reducing the risk of diseases such as cancer. Iodine is an essential component of thyroid hormones, which regulate metabolism, growth, and nervous system functions. Iodine deficiency can lead to goiter, disrupting hormone synthesis and affecting overall physiological stability.

### 2.3 The Stability and Changes of Atoms

Most atoms in the human body exist in a stable state, ensuring the maintenance of physiological structures and functions. Calcium atoms, for instance, contribute to bone formation, where their stable nuclei allow them to form strong crystal structures [11]. This stability grants bones the necessary strength and rigidity to support bodily movements and withstand external forces. However, some atoms, such as radioactive isotopes, exhibit instability. Radioactive atoms possess unstable nuclei that decay over time, emitting radiation in the form of alpha ( $\alpha$ ) particles, beta ( $\beta$ ) particles, or gamma ( $\gamma$ ) rays. One example is potassium-40, a naturally occurring radioactive isotope in the human body. Though present in minuscule amounts, potassium-40 undergoes beta decay, transforming into argon-40 or calcium-40. This radioactive decay can interact with cellular molecules, potentially damaging DNA and leading to genetic mutations. If these mutations affect critical genes, they may disrupt cellular function and increase the risk of diseases such as cancer. Epidemiological studies indicate that prolonged exposure to high radiation levels correlates with a significantly increased cancer risk. Atoms in the human body are not static; they continuously participate in metabolic processes. Through diet, the body absorbs nutrients containing essential atoms. Proteins in food, for example, are broken down into amino acids, which are then reassembled into new proteins required for cell growth, repair, and maintenance. Simultaneously, metabolic waste products are expelled through respiration and excretion. For instance, carbon and oxygen atoms in carbon dioxide — produced during cellular respiration — are eliminated via exhalation, while nitrogen atoms in urea are excreted through urine.

The constant exchange and renewal of atoms are vital for sustaining normal physiological functions. A well-regulated metabolism ensures that cells receive necessary nutrients while efficiently removing waste. However, disruptions in metabolic processes can lead to health complications. Malnutrition, for example, results in deficiencies of critical atoms and nutrients, impairing cellular function and weakening immunity. Likewise, kidney diseases can disrupt nitrogen waste excretion, causing nitrogen accumulation in the body and leading to conditions such as uremia, which can have severe health consequences.

## III. Atomic Memory and the Conjecture of Reincarnation

### 3.1 Theoretical Discussion on Atomic Memory

The concept of atomic memory posits that certain special atoms possess the ability to record and store information, with this capability potentially being linked to their microscopic structure and quantum states [12]. From a quantum mechanics perspective, electrons within atoms exist in specific quantum states, which can carry and encode information. The fundamental principle of quantum bits (qubits) relies on the superposition and entanglement properties of quantum states, enabling unprecedented efficiency in information storage and processing. In quantum computing, a qubit can exist simultaneously in a superposition of 0 and 1, vastly enhancing computational power and information-handling capacity. Additionally, the energy level structure of atoms provides a theoretical foundation for information storage. When an atom absorbs or emits energy, electrons transition between different energy levels, and these transitions can be associated with specific information encoding. Through precise control of atomic energy level transitions — such as by employing laser pulses — it is possible to achieve highly controlled writing, reading, and storage of information. Research has demonstrated that atomic energy level transitions can be precisely manipulated, offering a high-density and stable method of information storage, which is considered a promising direction for future data storage technologies. From an information storage perspective, the principle of atomic memory bears similarities to biological memory formation mechanisms. In living organisms, neurons transmit information through synapses, where synaptic strength changes in response to stimulation, forming memories. Analogously, alterations in an atom's electron cloud distribution and quantum states can be likened to synaptic modifications, allowing atoms to record external stimuli and store information. When subjected to specific physical or chemical environments, an atom's electron cloud distribution changes, effectively encoding environmental information. Certain chemical reactions induce structural changes in the electron clouds of atoms, thereby recording energy transitions and material interactions.

Recent advancements provide empirical support for the atomic memory hypothesis. Experimental studies indicate that some metal atoms exhibit memory effects within specific crystal structures. In certain magnetic materials, atomic magnetic moments can be aligned by an external magnetic field and maintain their orientation even after the field is removed — effectively storing information in a manner akin to non-volatile memory. This memory effect not only has significant implications for fundamental physics but also holds potential applications in information storage and sensor technologies. By leveraging atomic materials with memory properties, novel non-volatile storage devices could be developed, enhancing data

reliability and longevity. In the domains of quantum computing and quantum information, atoms have been extensively explored as candidates for qubits due to their inherent memory and information-processing capabilities. The precise manipulation of atomic quantum states enables quantum information storage, transmission, and processing. Experimental demonstrations have successfully employed individual atoms as qubits, executing elementary quantum computing and communication tasks. These findings lend experimental credibility to the atomic memory theory and underscore the profound potential of atomic-scale memory systems in future quantum technologies.

### 3.2 Viewing the Phenomenon of Reincarnation from the Conservation of Atoms

The law of atomic conservation, a fundamental principle in physics, provides a robust theoretical foundation for understanding the transformation and cycling of matter. In chemical reactions, the types and quantities of atoms remain unchanged, signifying that matter neither vanishes nor spontaneously emerges but instead undergoes structural and combinatorial rearrangements. For instance, when hydrogen burns in the presence of oxygen to form water, two hydrogen molecules ( $H_2$ ) react with one oxygen molecule ( $O_2$ ) to yield two water molecules ( $H_2O$ ). Throughout this process, the total number of hydrogen and oxygen atoms remains constant, with only the chemical bonds reorganizing. Similarly, the human body, as a complex atomic system, adheres to the law of atomic conservation. Upon death, the atoms comprising the body do not disappear but re-enter natural cycles through various processes. In cremation, for example, high temperatures break down organic matter, converting proteins, fats, and carbohydrates into gases such as carbon dioxide and water vapor, which subsequently integrate into atmospheric and ecological cycles. Carbon atoms bond with oxygen to form carbon dioxide, contributing to plant photosynthesis, while hydrogen atoms form water molecules that enter the hydrological cycle. Meanwhile, inorganic elements like calcium and phosphorus persist as ashes, later assimilated into soil and geological processes. Sky burial exemplifies another form of atomic recycling, wherein scavengers consume the body, facilitating the redistribution of its atomic constituents. Vultures digest organic matter, incorporating its atomic components into their biological systems, while undigested remnants are excreted and reintegrated into the ecosystem. Microorganisms in the soil further decompose organic molecules, incorporating their constituent atoms into the broader environmental cycle.

From the perspective of atomic conservation, reincarnation can be interpreted as the perpetual recycling and reconfiguration of atoms within nature [13]. Upon death, the body's atomic components disperse and participate in various natural processes, ultimately contributing to the formation of new substances and life forms. Within ecosystems, plants assimilate carbon,

hydrogen, and oxygen atoms from carbon dioxide and water to synthesize organic compounds. These compounds, in turn, nourish animals, perpetuating the transfer of atomic material across biological systems. Upon an animal's death, its atomic constituents re-enter nature, perpetuating the cycle of matter. Theoretically, if the atoms that once constituted a human body were to reassemble into a structurally identical form at some point in the future, this could be regarded as a materialistic analogy to the traditional concept of reincarnation. Although current scientific understanding deems this scenario exceedingly improbable—given the astronomical number of possible atomic combinations—such a possibility remains theoretically conceivable within the framework of atomic conservation and matter cycling. Over vast cosmic timescales and across immense spatial dimensions, the random recombination of atoms may, at some moment, yield a life structure bearing resemblance to a previous one. While the probability of exact atomic replication is infinitesimally small due to the immense combinatorial complexity, this line of thought invites intriguing theoretical speculation regarding the relationship between reincarnation and atomic conservation.

### 3.3 Case Analysis of Reincarnation

Numerous cases of reincarnation have been reported worldwide, among which the case of James Leininger has garnered significant attention. From early childhood, James exhibited an extraordinary interest in and understanding of airplanes. Initially, his behavior was indistinguishable from that of an ordinary child, engaging in typical play with various toys. However, at 22 months old, after visiting the Cavanaugh Flight Museum in Dallas, his fascination with airplanes intensified markedly. From that point forward, he frequently played with airplane toys, often reenacting crash scenarios, and began experiencing recurrent nightmares involving airplane crashes. During these nightmares, he would murmur phrases such as, "Airplane crash! Plane on fire! Little man can't get out." Even more remarkably, James displayed an in-depth knowledge of aircraft structures. For instance, when his mother pointed to a component under a toy airplane and identified it as a bomb, he corrected her, explaining that it was a detachable auxiliary fuel tank. He also provided detailed descriptions of the "Corsair" fighter plane he allegedly piloted in a past life, recounting missions launched from the USS Natoma Bay, culminating in his aircraft being struck by enemy fire and crashing. Additionally, he recalled the name of a comrade, Jack Larsen. Upon investigation, his father managed to locate Jack Larsen, who was in his nineties. Astonishingly, young James recognized individuals in old photographs of former squadron members and accurately recounted specific details of their past.

From the perspective of atomic memory, if atoms possess the capacity to retain information, one possible explanation is that some of the atoms comprising James Leininger's

body may have once belonged to pilot James Huston in a previous life. These atoms could have carried residual memory traces, which, under an unknown triggering mechanism, were reactivated in James, enabling him to recall experiences from his purported past life. At the quantum level, fluctuations in atomic quantum states might play a role in the storage and transmission of memory. Similar to quantum bits that encode and process information, these atomic quantum state changes could hypothetically allow James to access memories from a previous existence. However, this case has sparked considerable debate. Skeptics argue that James' recollections may have been influenced by external factors, such as exposure to aviation-related information through media or conversations. Although his parents claim he had minimal exposure to such content, the possibility of subconscious information absorption cannot be entirely dismissed.

From a scientific standpoint, there is currently no conclusive empirical evidence supporting the existence of atomic memory or reincarnation. Contemporary scientific methodologies rely on reproducible experiments and empirical validation, and the phenomenon of reincarnation remains difficult to investigate using traditional scientific frameworks. While James Leininger's case is undoubtedly intriguing, alternative explanations exist, and further research is required to establish any definitive connection between atomic memory and reincarnation.

#### **4. Scientific Analysis of Dreams**

##### **4.1 The Physiological Basis of Dreams**

Sleep is a complex physiological process, and the brain plays a central role in sleep, with its activities closely linked to the generation of dreams. Sleep can be divided into two main stages: non-rapid eye movement (NREM) sleep and rapid eye movement (REM) sleep, and the activity patterns and physiological characteristics of the brain are different in each stage [14, 15]. During the NREM sleep stage, the activity of the brain gradually slows down. This stage can be further divided into three periods: The N1 stage is the initial stage of sleep. People gradually lose their attention to the surrounding environment, and slow eye movements occur. The heart rate and body temperature begin to drop. At this time, the neuronal activity of the brain is relatively stable, and the brain waves exhibit the characteristics of relatively low frequency and small amplitude. For example, the  $\alpha$  waves gradually decrease, and the  $\theta$  waves begin to appear. In the N2 stage, the muscle tone of the whole body decreases, and there is almost no eye movement. The brain activity slows down further. The  $\theta$  waves dominate in the brain waves, and some sleep spindles and K-complex waves will also appear. These special brain wave signals are believed to be related to the brain's information processing and memory consolidation. The N3 stage is the deep sleep stage. The muscle tone is further reduced, and it is not easy to be awakened. At this time, the brain is in a

state of deep rest, and the brain waves are mainly high-amplitude and low-frequency  $\delta$  waves. The metabolism of the brain slows down, and the body undergoes various physiological repairs and energy reserves. When sleep enters the REM sleep stage, significant changes occur in the activity of the brain. At this time, the neuronal activity of the brain becomes extremely active, and the frequency and amplitude of the brain waves are similar to those when awake, showing rapid and irregular characteristics, which indicates that the brain is in a highly active state at this stage. During REM sleep, the eyes will move rapidly, and there may be brief myoelectric activities in the muscles of the distal parts of the limbs and the facial expression muscles. The breathing and heart rate will also become irregular. Functional magnetic resonance imaging (fMRI) studies have found that during the REM sleep stage, multiple regions of the brain, such as the visual cortex, amygdala, and hippocampus, all show a high level of activity. The activity of the visual cortex enables us to generate rich visual images in our dreams; the amygdala is closely related to emotional processing, and its activity often leads to strong emotional experiences in dreams; the hippocampus plays an important role in the consolidation and retrieval of memories, and its activity may be related to the processing and integration of memories in dreams. Neurotransmitters also play a key role in the generation of dreams. Dopamine, as an important neurotransmitter, is closely related to the brain's reward system and emotional regulation. Studies have found that during REM sleep, the release of dopamine increases, which may be related to emotional experiences such as pleasure and excitement in dreams. In some dreams, people may dream of scenes such as achieving success and reaching their goals. At this time, the secretion of dopamine in the brain may increase accordingly, thereby enhancing these positive emotional feelings. Acetylcholine also plays an important role in REM sleep. It participates in regulating the excitability of the brain and the signal transmission between neurons. During the REM sleep stage, the level of acetylcholine increases, making the neuronal activity of the brain more active and promoting the generation and development of dreams. Gamma-aminobutyric acid (GABA) is an inhibitory neurotransmitter that plays an important regulatory role in NREM sleep. During NREM sleep, the release of GABA increases, inhibiting the activity of brain neurons and enabling the brain to enter a relatively quiet state, which helps to maintain the stability and depth of sleep. If the secretion of GABA is abnormal, it may lead to sleep disorders and affect the normal generation of dreams. Some insomnia patients have insufficient GABA secretion, resulting in over-excitation of brain neurons, making it difficult to enter deep sleep, and their dreams may also become more chaotic and unstable.

##### **4.2 The Psychological Significance of Dreams**

Dreams play a crucial role in emotional regulation, providing individuals with a safe space to experience and process various emotions. In real life, when people encounter setbacks, stress, or trauma, negative emotions are often suppressed in the subconscious. However, in dreams, these emotions find an outlet for expression and release. Research indicates that individuals who have undergone traumatic events, such as war veterans and survivors of natural disasters, frequently relive scenes related to their trauma in dreams. These dreams often evoke intense emotions such as fear, anger, and sadness. Through this process, the brain gradually processes and integrates traumatic memories, mitigating emotional distress and thereby contributing to emotional regulation. A study on patients with post-traumatic stress disorder (PTSD) found that guiding individuals to re-examine and interpret traumatic dream content during therapy can help them better manage emotional challenges in real life and alleviate PTSD symptoms. Dreams are also closely linked to memory consolidation. During sleep, the brain organizes and stores information acquired throughout the day. After learning new knowledge or skills, individuals often experience dreams related to the learning content, indicating that the brain is actively processing and reinforcing this information. A study conducted in Germany involved participants memorizing a series of words, after which some were allowed to sleep while others remained awake. The results showed that those who slept performed better in subsequent recall tests, and their reported dreams frequently contained elements related to the learned words. This suggests that dreams facilitate the transformation of short-term memories into long-term storage, enhancing memory stability and durability. From a neurobiological perspective, the hippocampus plays a pivotal role in memory consolidation. During the rapid eye movement (REM) sleep stage, neural activity between the hippocampus and cerebral cortex intensifies, potentially promoting memory integration and strengthening.

From a psychoanalytic perspective, Freud posited that dreams serve as expressions of subconscious desires. In everyday life, many human desires and impulses are restrained by societal norms, laws, and practical limitations, preventing direct fulfillment. These repressed desires and impulses manifest symbolically in dreams. For instance, dreaming of flying may symbolize a yearning for freedom, while dreaming of acquiring great wealth may reflect an aspiration for material success. Freud developed a method of dream interpretation aimed at deciphering symbolic elements within dreams to reveal underlying subconscious desires and conflicts. Jung's analytical psychology presents an alternative perspective, suggesting that dreams reflect the collective unconscious — a repository of shared psychological content accumulated throughout human evolution, including various archetypes and symbolic images. In dreams, these archetypes manifest in diverse

forms, aiding individuals in resolving internal conflicts. For example, Jung's concepts of "Anima" and "Animus" represent the feminine qualities within men and the masculine qualities within women, respectively. These archetypes may appear in dreams as specific characters, guiding individuals toward self-discovery and personal development. A man, for instance, might dream of a wise and compassionate woman, symbolizing his "Anima." Through interactions with this dream figure, he may gain deeper insight into his emotions and intuition, fostering inner harmony and psychological growth.

### 4.3 The Connection between Dreams and Reality

Dreams and reality share an intricate and dynamic relationship. The ancient adage "As one thinks during the day, so one dreams at night" encapsulates the notion that dreams mirror and distort real-life experiences. Daily events, emotions, thoughts, and perceptions frequently find expression in dreams. Individuals intensely engaged in study or work often dream about related scenarios. For instance, a student rigorously preparing for a mathematics exam may dream of solving equations or taking an exam. The dream may vividly reconstruct the testing environment, question types, and accompanying anxiety, reflecting the brain's ongoing processing and integration of daytime experiences during sleep. Emotional experiences serve as another critical bridge between dreams and reality. Emotional states—whether joy, sorrow, anxiety, or fear—often persist or even intensify in dreams. Negative emotions, such as frustration or disappointment in real life, may be exaggerated in dreams, manifesting in distressing scenarios like losing everything or facing insurmountable obstacles. Conversely, positive real-life experiences, such as reuniting with loved ones or achieving personal success, may be revisited in dreams, allowing individuals to re-experience those emotions. Dreams, however, are not mere reflections of reality; they can actively influence real life. Some dreams provide creative inspiration and problem-solving insights. History abounds with examples of scientists, artists, and writers deriving groundbreaking ideas from dreams. For instance, the German chemist Friedrich Kekulé famously envisioned a snake biting its own tail in a dream, which led to his discovery of benzene's ring structure. Similarly, the surrealist artist Salvador Dalí drew inspiration from dreamlike visions for his iconic works. These examples illustrate how dreams can transcend conventional thought patterns, offering novel perspectives and stimulating creativity. Furthermore, dreams can serve as problem-solving mechanisms. The subconscious mind continues to analyze and process real-life dilemmas during sleep, sometimes leading to sudden insights. Problems that seem unsolvable during waking hours may be approached from a fresh perspective in dreams. For instance, an entrepreneur struggling with a crucial business decision may suddenly grasp the solution in a dream. This phenomenon occurs because, during sleep, cognitive

processes operate more freely and flexibly, allowing the brain to reframe challenges and identify innovative solutions.

## **V. Multi-Dimensional Heterogeneous Spaces in Dreams**

### **5.1 Overview of Multi-Dimensional Space Theory**

Multi-dimensional space theory is a cutting-edge and highly challenging field in modern physics, bringing profound changes to the traditional understanding of time and space. Over the course of physics' development, our comprehension of spatial dimensions has continuously deepened. Initially, Newtonian mechanics described a three-dimensional space consisting of length, width, and height — dimensions we perceive in daily life — where objects move according to classical mechanical laws. The advent of Einstein's theory of relativity introduced time as the fourth dimension, interwoven with the three spatial dimensions to form a four-dimensional spacetime. Within this framework, time is no longer an absolute entity independent of space but is instead interrelated with it. The motion speed and mass of an object can cause spacetime curvature, an effect particularly prominent near massive celestial bodies. For instance, the spacetime surrounding a black hole is significantly warped, causing even light to bend as it passes through these regions. Superstring theory further expands our understanding of dimensions, suggesting that the universe may contain ten or more dimensions. In this theory, elementary particles are not considered point-like but instead as one-dimensional strings whose different vibrational modes correspond to different particles. To maintain theoretical self-consistency, additional dimensions are required to describe string motion and interactions. These dimensions are undetectable in everyday life because they are compactified on an extremely small scale—on the order of the Planck length (approximately  $1.616 \times 10^{-35}$  meters). A useful analogy is a two-dimensional being confined to a flat plane, perceiving only length and width. This being would be unable to comprehend the concept of height in three-dimensional space. Similarly, humans, bound to four-dimensional spacetime, struggle to perceive additional dimensions directly, relying instead on mathematical models and theoretical derivations to infer their properties.

A simple metaphor for understanding higher-dimensional spaces is imagining a two-dimensional plane as a sheet of paper. Creatures living on this plane can only move within its boundaries and cannot perceive the third dimension. When a three-dimensional sphere passes through the plane, these creatures would only observe a gradually expanding and then contracting circular cross-section rather than the full form of the sphere itself. Likewise, we, as beings in four-dimensional spacetime, lack an intuitive perception of higher dimensions and must infer their existence through indirect means. Although additional dimensions in superstring theory remain unobservable, they may play a crucial role in governing physical phenomena at

microscopic scales. Multi-dimensional space theory offers new insights into the properties and interactions of elementary particles. The interactions between different dimensions may determine fundamental attributes such as mass and charge, as well as the nature of force interactions. Some theoretical models suggest that gravity propagates differently in high-dimensional spaces compared to four-dimensional spacetime, potentially explaining why gravity is significantly weaker than the other three fundamental forces—electromagnetic force, strong interaction, and weak interaction. If additional dimensions exist, gravity may "leak" into them, leading to its apparent weakness in the spacetime we experience.

### **5.2 Manifestations of Multi-Dimensional Spaces in Dreams**

Dreams frequently exhibit transcendent spatiotemporal experiences that defy conventional reality, providing valuable material for exploring the potential connections between dreams and multi-dimensional spaces. One of the most common phenomena in dreams is the compression or stretching of time. In waking life, time follows a stable linear progression, measured by clocks and daily routines. However, in dreams, time becomes highly malleable. A person may experience an entire lifetime within a dream—growing up, aging, and undergoing significant life events—only to awaken and realize that mere minutes have elapsed in reality. This temporal compression allows dreams to encapsulate extensive life experiences and deep emotional journeys within brief periods. Conversely, dreams can also exhibit time dilation, where dreamers perceive themselves trapped in prolonged sequences that seem to stretch indefinitely. In certain dreams, every step of a journey may feel laborious, as though time has nearly halted, with each moment elongated. This temporal stretching enhances dreamers' awareness of intricate details, making the passage of time feel secondary to the depth of the experience itself. Spatial distortions are another hallmark of multi-dimensional dreamscapes. In waking life, space adheres to the principles of Euclidean geometry, with objects having well-defined positions, distances, and orientations. Dreams, however, often defy these geometric constraints, presenting surreal, fluid environments. A dreamer may find themselves in a room where walls, ceilings, and floors curve and fold unpredictably, as though space has been warped by an unseen force. Walls may ripple like waves, while floors and ceilings intersect, creating a strong sense of spatial disorientation. Dreams may also feature transitions between different dimensions, offering glimpses into what could be higher-dimensional spaces. For instance, a dreamer might pass through solid walls effortlessly or experience unbounded flight, transcending the gravitational and spatial limitations of three-dimensional reality. Walking through walls suggests a shift into a space where conventional physical boundaries dissolve, possibly hinting at interactions with higher dimensions. Similarly, the



sensation of floating or flying may signify movement within a dimension that provides greater degrees of freedom beyond those available in ordinary spacetime.

Additionally, dreams frequently present surreal landscapes that seem to stem from higher-dimensional spaces with entirely different physical laws. A dreamer might witness a city composed of liquid structures, where buildings continuously change shape, and streets shimmer with shifting, multicolored lights. These surreal environments, detached from real-world physics, may reflect the properties of higher-dimensional realms. Such dreamscapes defy logic and classical spatial constraints, suggesting that dreams may momentarily grant access to abstract, non-Euclidean spaces beyond our everyday experience.

### **5.3 The Association between Dreams and Parallel Universes**

The potential connections between dreams and parallel universes offer a thought-provoking perspective on the nature of both dreams and the universe itself. Theoretically, the concept of parallel universes originates from the many-worlds interpretation in quantum mechanics. According to this interpretation, when a quantum measurement is performed on a quantum system, the system branches into multiple outcomes, each representing a distinct reality within a parallel universe. This implies that, at the microscopic level, every quantum event gives rise to multiple branches of reality, which, in turn, manifest as different possibilities in the macroscopic world. In dreams, individuals often experience scenes and events that are vastly different from their waking reality. Such dream experiences may be interpreted as glimpses into parallel universes, where alternate versions of reality unfold. The manifestations of parallel universes in dreams take diverse forms. In some instances, the dream environment closely resembles the real world but with altered details. For example, a dreamer may find themselves in a familiar city, yet the urban layout, architectural styles, and social dynamics differ from reality. Streets may be rearranged, familiar landmarks may be absent or replaced, and individuals may exhibit distinct behaviors and attire. These discrepancies suggest that dreams may reflect another version of reality existing in a parallel universe, where the developmental trajectory of the city diverges from that of our own.

Furthermore, certain dream scenarios defy the fundamental laws of physics, reinforcing the notion of alternative realities governed by different physical principles. In our waking world, physical phenomena adhere to Newtonian mechanics, with forces such as gravity and friction operating predictably. However, dreams often feature surreal occurrences—objects floating weightlessly, individuals soaring effortlessly through the air, or time and space undergoing inexplicable distortions. A dreamer may leap effortlessly to the top of a skyscraper or witness

objects moving autonomously without an apparent force acting upon them. While such occurrences violate physical laws as we understand them, they could be conceivable in parallel universes where different constants and interaction mechanisms govern reality.

A compelling illustration of this concept is found in the film *Coherence*, which explores the interplay between parallel universes. The movie follows a group of friends who, on the night of a comet's passing, experience inexplicable alterations in their surroundings. They gradually realize that they are navigating multiple parallel universes, each differing subtly or drastically from their own. The protagonists' movement between these universes, influenced by their choices and actions, results in varied interpersonal dynamics—some universes depict harmony among friends, while others showcase conflict and distrust. From the perspective of dream-parallel universe theory, these shifting realities mirror the fragmented yet interconnected narratives we experience in dreams. The characters' ability to traverse different universes resembles the seamless transitions between dream scenarios, where each possibility represents an exploration of different subconscious potentials. Moreover, *Coherence* highlights the uncertainty and mutual influence among parallel universes, an aspect that also resonates with dream experiences. In the film, characters from different universes inadvertently affect each other, struggling to identify and navigate their desired reality. Similarly, dreams exhibit intricate interplays of emotions, thoughts, and memories, producing unpredictable sequences and interactions. This inherent uncertainty in both dreams and parallel universes suggests a deeper connection between subconscious cognition and the nature of reality itself.

## **VI. The Manifestation of Temporal-Spatial Interlacing in Dreams**

### **6.1 Case Analysis of Temporal-Spatial Interlacing in Dreams**

The film *Your Name* provides an insightful case study into the phenomenon of temporal-spatial interlacing in dreams. The story revolves around two protagonists, Mitsuha Miyamizu and Taki Tachibana, who inexplicably swap identities across time and space within their dreams. This unique narrative structure serves as a compelling illustration of the intricate relationship between dreams and temporal-spatial interlacing. Mitsuha resides in the tranquil town of Itomori, yearning for the excitement of city life, while Taki lives in the bustling metropolis of Tokyo, juggling academic responsibilities and part-time work. Though they exist in separate temporal and spatial dimensions, their dreams become the medium through which their lives intersect. When Mitsuha dreams as Taki, she navigates Tokyo's fast-paced streets, interacting with his friends and engaging in his daily routines—experiences entirely foreign to her rural upbringing. Conversely, when Taki dreams as Mitsuha, he immerses himself in the

serenity of Itomori, partaking in her familial and school life. This dream-induced identity exchange transcends conventional spatial boundaries, challenging the fixed nature of identity and locality in the waking world.

Beyond spatial interlacing, the film also introduces a temporal dimension to their dream experiences. Their identity swaps do not occur simultaneously but follow a staggered timeline. When Mitsuha inhabits Taki's reality, Taki has yet to experience Mitsuha's life, and vice versa. This chronological misalignment introduces elements of suspense and complexity into their interactions. They attempt to communicate by leaving messages on mobile phones and marking each other's bodies, only to discover that these records sometimes change, indicating fluctuations in their respective timelines. The transmission of information across different time dimensions underscores the enigmatic nature of temporal-spatial interlacing within dreams.

The theme of temporal-spatial interlacing in *Your Name* is deeply intertwined with fate. Mitsuha and Taki's dream encounters initially seem coincidental, yet they are ultimately revealed to be dictated by a predetermined cosmic alignment. Through these interwoven dreams, they gradually develop an emotional bond and uncover the connection between their experiences and an impending disaster in Itomori. Determined to alter destiny, they strive across both dreams and reality to find each other and prevent catastrophe. Their relentless pursuit transcends time and space, symbolizing human resilience against fate's uncertainties. Their journey, from Itomori to Tokyo and from past to future, highlights the enduring power of memory, love, and determination in overcoming spatial-temporal constraints. From a theoretical perspective, the phenomenon of temporal-spatial interlacing in *Your Name* can be viewed as a metaphor for higher-dimensional spaces. In their dreams, Mitsuha and Taki break free from the limitations of conventional time-space constraints, seamlessly transitioning between identities and realities. This suggests that dreams may serve as a conduit connecting different dimensions, allowing consciousness to momentarily transcend physical boundaries. Their experiences in dreams resemble traversing multi-dimensional spaces, offering a glimpse into alternative realities beyond human perception. Through its poetic depiction of temporal-spatial interlacing, *Your Name* invites audiences to contemplate the profound mysteries of time, space, and the boundless possibilities encapsulated within dreams.

## 6.2 Scientific and Philosophical Reflections on Temporal-Spatial Interlacing

From a physics perspective, the possibility of temporal-spatial interlacing is closely linked to the theories of general relativity and quantum mechanics. General relativity posits that spacetime is a four-dimensional structure that can be curved by matter and energy. In the presence of strong

gravitational fields, such as those around black holes, spacetime curvature can become extreme, potentially distorting both time and space. According to the gravitational time dilation effect in general relativity, time passes more slowly in stronger gravitational fields. This suggests that the progression of time can vary in different gravitational environments, potentially giving rise to temporal-spatial interlacing. Near a black hole, time may pass at a significantly different rate than on Earth, causing different time scales to interlace.

Quantum mechanics, on the other hand, reveals peculiar phenomena in the microscopic world, such as quantum entanglement and quantum tunneling. Quantum entanglement refers to a non-local correlation between two or more quantum systems, where a measurement on one system can instantaneously affect the state of the other, regardless of the distance between them. This phenomenon challenges traditional concepts of time and space, suggesting that there may be spatiotemporal connections in the microscopic world that transcend our everyday understanding. The quantum tunneling effect, which allows particles to cross potential barriers deemed insurmountable by classical mechanics, further demonstrates that the physical laws governing the microscopic realm differ from those of the macroscopic world. These differences imply the possibility of spatiotemporal jumps and interlacings.

From a philosophical standpoint, temporal-spatial interlacing challenges the law of causality, which asserts that causes precede their effects, and events follow a clear causal sequence. In the context of temporal-spatial interlacing, however, causal relationships may become ambiguous. For instance, if a person were able to travel back in time, their actions could alter past events, potentially influencing future outcomes, thereby creating a conflict with the law of causality. The "grandfather paradox" is a well-known example of this dilemma: if a person were to travel back and kill their grandfather, they would never have been born, creating a logical contradiction. To resolve this paradox, philosophers have proposed several theories. One such theory, the "parallel universe theory," suggests that altering history through time travel results in the creation of a new parallel universe. In this new universe, history would be altered, but the original universe would remain unchanged. This implies that temporal-spatial interlacing could allow causal relationships in different universes to remain independent of each other, preventing conflicts with the law of causality.

Temporal-spatial interlacing also raises profound questions about fate. If such interlacing is possible, does it imply that the future is already determined, or do individuals retain the free will to change their destinies? Some philosophers argue that temporal-spatial interlacing suggests a predetermined future, with past, present, and future coexisting in different spatiotemporal dimensions, where individuals simply follow predetermined trajectories.

However, others maintain that even in the presence of temporal-spatial interlacing, people still possess free will. In various spatiotemporal contexts, individuals' choices and actions can still influence the development of events. In dreams, we may experience scenes of temporal-spatial interlacing. Though these scenes unfold in dreams, they reflect our deep desires and will, suggesting that even in such interlaced states, people are still capable of making choices. Human understanding of time and space is inherently limited, complicating our comprehension of temporal-spatial interlacing. Our perception and cognitive frameworks are based on everyday spatiotemporal experiences, making it difficult to directly perceive and understand phenomena beyond our experience. For example, we cannot directly observe quantum phenomena or easily conceptualize the true nature of high-dimensional spaces. In studying temporal-spatial interlacing, we rely on mathematical models and theoretical frameworks to infer its potentialities and characteristics. Yet, it remains uncertain whether these models truly capture the essence of time and space.

The advancement of science and technology plays a pivotal role in shaping our understanding of temporal-spatial interlacing. With improvements in observational technology, we can now detect more distant celestial bodies and study microscopic particles, providing us with valuable data for exploring time and space. The detection of gravitational waves has given us deeper insights into the curvature and fluctuations of spacetime. Research on microscopic particles has further enhanced our understanding of quantum spatiotemporal characteristics. Additionally, developments in virtual and augmented reality technologies allow us to simulate and experience temporal-spatial interlacing, providing new avenues for studying and engaging with this phenomenon.

### **6.3 The Enlightenment of Temporal-Spatial Interlacing in Dreams on Human Cognition**

The phenomenon of temporal-spatial interlacing in dreams offers profound insights into humanity's understanding of the world and the self, with significant implications for fields such as scientific research and artistic creation. In scientific research, the temporal-spatial interlacing in dreams provides scientists with fresh perspectives and new research directions. It challenges the traditional concepts of time and space as being certain and continuous, encouraging a reevaluation of their essence and characteristics. The advent of quantum mechanics has already uncovered peculiar properties of time and space in the microscopic world, such as quantum entanglement and the quantum tunneling effect. These phenomena share similarities with the temporal-spatial interlacing found in dreams. By drawing inspiration from dreams, scientists may uncover deeper insights into the mysteries of time and space, advancing fields like quantum mechanics. Moreover, temporal-spatial interlacing in dreams may offer innovative

approaches to solving scientific challenges. When studying complex systems—such as the evolution of the universe or the origin of life—traditional scientific methods can be limiting. The temporal-spatial interlacing seen in dreams can inspire scientists to transcend conventional thinking, enabling them to explore problems from new spatiotemporal dimensions and perspectives, thereby uncovering novel solutions. Several notable scientific discoveries have been inspired by dreams. For instance, the German chemist Kekulé famously discovered the ring structure of the benzene molecule in a dream, a breakthrough that significantly advanced the field of organic chemistry.

In the realm of artistic creation, the temporal-spatial interlacing in dreams provides artists with rich materials and unique forms of expression. Dreams allow for the creation of imaginative and innovative works, influenced by temporal-spatial experiences that defy conventional limits. In painting, surrealist artists frequently draw upon dreams to create images filled with fantastical colors and temporal-spatial disarray. For example, in Dalí's *The Persistence of Memory*, the soft, melting clocks draped over branches and platforms convey a scene that transcends real time and space, offering a unique perspective on time. Similarly, in literature, elements of temporal-spatial interlacing in dreams are widely used to enrich narrative themes and emotional depth. In Alice's Adventures in Wonderland, Alice's journey into a world of fantastical creatures and unstable time-space reflects a chaotic, dream-like experience. In this world, her body changes size, and time and space lose their usual rules. Through this dream-like tale, the author explores themes of personal growth, self-awareness, and the relationship to the real world. The temporal-spatial interlacing in dreams also empowers artists to transcend the constraints of reality, allowing for a freer expression of emotions and thoughts. In the waking world, individuals often face emotional and cognitive restrictions, but dreams break these boundaries, enabling more liberated artistic expression. Artists can merge elements such as reality and fantasy, the past and the future, and the self and others through temporal-spatial interlacing in dreams, creating unique and resonant artistic imagery that prompts reflection in the audience or readers.

From the perspective of human self-awareness, temporal-spatial interlacing in dreams reflects the subconscious. It exposes deep-seated emotions, desires, fears, and conflicts. By analyzing and interpreting these interlaced time-space experiences in dreams, individuals can gain a deeper understanding of their subconscious, identifying internal issues and unmet needs. For instance, recurring dreams involving time travel—whether returning to the past or visiting the future—may indicate unresolved regrets or anxiety about the future. By reflecting on these dreams, individuals can gain insight into their emotional states and adjust their thoughts and behaviors accordingly.

Furthermore, temporal-spatial interlacing in dreams can help expand the boundaries of self-awareness, encouraging individuals to recognize the diversity and complexity of the self. In dreams, people may experience different identities, roles, and life scenarios. These experiences highlight that the self is not a singular, static entity, but rather a multifaceted being that contains numerous potential possibilities and facets. This realization helps individuals accept themselves more fully, fostering personal growth and development.

## **VII. Conclusions and Prospects**

### **7.1 Research Summary**

This research has deeply explored several closely related topics, including atomic structure, atomic memory, reincarnation, multi-dimensional spaces in dreams, and temporal-spatial interlacing. Atoms, as the fundamental units composing the human body, determine the physical and chemical properties of substances and play a crucial role in physiological processes. Carbon atoms form the backbone of life-sustaining molecules, hydrogen atoms regulate acid-base balance and energy metabolism, oxygen atoms are essential for respiration, and nitrogen atoms are key components of proteins and nucleic acids. Trace elements are also vital for maintaining normal physiological functions. The stability and changes in atoms directly impact human health and the body's physiological processes. While most atoms in the human body remain stable, the decay of radioactive atoms can damage cells and increase disease risk. Metabolic exchanges and the renewal of atoms ensure normal cell function, reflecting the dynamic balance required for life processes. The theoretical exploration of atomic memory offers a novel perspective for explaining life phenomena. From the standpoint of quantum mechanics, the quantum states and energy-level structures of atoms may relate to information storage, akin to biological memory formation. Experimental studies have shown some support for atomic memory, such as the memory effects of specific metal atoms in certain crystal structures and the role of atoms in quantum computing.

Regarding atomic conservation, the phenomenon of reincarnation can be viewed as the cyclical recombination of atoms in nature. After death, atoms return to nature and are restructured through natural processes into new substances and life forms. Although there is no definitive proof of reincarnation, approaching the concept from the atomic cycle perspective offers a new scientific dimension. The case of James Leininger, who seemingly recalled past-life memories, illustrates the potential connection between reincarnation and atomic memory. If certain atoms possess memory, it suggests that atoms constituting James Leininger's body might carry information from a past life, such as that of a previous pilot. While this case has sparked debates, further scientific research is needed to explore and substantiate these ideas.

Dreams, as complex physiological and psychological phenomena, are closely linked to brain activity during sleep. Changes in neuronal activity and neurotransmitter secretion during NREM and REM sleep stages provide the physiological foundation for dreams. Dreams not only reflect and distort real-life experiences but also play a crucial role in emotional regulation and memory consolidation, often revealing subconscious desires and conflicts. Dreams frequently exhibit multi-dimensional characteristics, such as time compression, spatial distortion, and dimensional intersections, aligning with multi-dimensional space theory. This suggests that dreams may serve as a bridge between different dimensions. The surreal scenes in dreams reflect high-dimensional space properties, offering valuable insights into the connection between dreams and multi-dimensional spaces. The movie *Coherence* highlights the potential link between dreams and parallel universes. The parallel-universe scenes in the film resemble the plots and scenarios found in dreams, both exploring different possibilities and the blending of reality and illusion. This connection implies that dreams might represent alternate realities within a parallel universe, providing a new avenue for understanding the nature of the universe and consciousness. Similarly, the film *Your Name* vividly portrays temporal-spatial interlacing in dreams. The protagonists exchange identities across time and space within their dreams, reflecting the distortion of time and space and the intertwined nature of fate and temporal-spatial interlacing. Scientifically and philosophically, the possibility of temporal-spatial interlacing relates to theories in general relativity and quantum mechanics while challenging traditional notions of causality and fate. Temporal-spatial interlacing in dreams has profound implications for human cognition. In scientific research, it offers new perspectives and research directions, contributing to fields such as quantum mechanics. In artistic creation, it provides rich material and unique forms of expression, fostering creativity. In terms of human self-awareness, it serves as an expression of the subconscious, helping individuals gain deeper insights into their inner worlds and expand their boundaries of self-cognition.

### **7.2 Limitations and Deficiencies of the Research**

Although this research has provided in-depth explorations in fields such as atoms, consciousness, reincarnation, dreams, and multi-dimensional spaces, it inevitably has limitations and deficiencies. In the exploration of atomic memory, the theoretical possibility of atomic memory and its relationship with quantum states and energy-level structures have been analyzed. However, this theory remains at the hypothesis stage and lacks direct experimental evidence. Due to the extremely small scale of atoms, experimental research faces significant technical challenges. Accurately detecting and verifying whether atoms possess memory capabilities, and understanding the specific mechanisms involved, remain difficult. Current

research mainly relies on theoretical derivations and analogical analyses, such as comparing atomic memory to biological memory and information storage in quantum computing. While these comparisons provide valuable insights, they cannot replace direct experimental verification.

Regarding the reincarnation phenomenon, a new interpretation from the perspective of atomic conservation has been proposed, analyzed through the case of James Leininger. However, reincarnation remains highly controversial and lacks scientific evidence. Most current cases of reincarnation are based on subjective personal accounts, which make objective verification and repeatability difficult. These accounts are often influenced by factors like memory biases, suggestion effects, and cultural backgrounds, raising questions about their authenticity and reliability. The scientific community's research into reincarnation is still exploratory, and a unified theoretical framework and research methods have not yet been established, hindering scientific explanation and verification. In the study of dreams and multi-dimensional spaces, while potential connections between dreams and multi-dimensional spaces have been explored through the analysis of temporal-spatial interlacing in dreams, significant limitations remain. Dreams are highly subjective, making objective measurement and analysis challenging. Most dream research relies on self-reports from dreamers, which introduce subjectivity and uncertainty, potentially biasing results. Theoretical research on multi-dimensional spaces, while informed by frameworks such as superstring theory, faces challenges in experimental verification and the complexity of the models involved. As a result, our understanding of multi-dimensional spaces in dreams is still in its early stages.

From an interdisciplinary perspective, this research involves multiple fields, including physics, biology, psychology, and philosophy. While this approach provides a more comprehensive view, it also presents challenges. Differences in theories and methods across disciplines can lead to contradictions and a lack of coordination during integration. For instance, unifying quantum mechanics theory with theories of consciousness and dreams in psychology is difficult. Building effective bridges between disciplines and achieving the organic integration of theories and methods remains a crucial issue for future research. Interdisciplinary research demands a broad knowledge base and interdisciplinary thinking, areas in which the current research team may still have gaps, limiting the full potential of the interdisciplinary approach.

### 7.3 Prospects for Future Research Directions

Future research on atoms, consciousness, reincarnation, dreams, and multi-dimensional spaces will involve in-depth explorations across multiple fields, with the potential for breakthrough progress. In atomic memory research, as quantum technology continues to advance, scientists will

focus on developing more sophisticated experimental techniques to directly detect the memory characteristics of atoms. High-precision quantum measurement tools, such as scanning tunneling microscopes and atomic force microscopes, will enable accurate measurement and manipulation of the quantum states of single atoms or atomic clusters. By observing how atoms store and change information in different environments, researchers aim to further verify the theoretical hypothesis of atomic memory and uncover its underlying mechanisms. Interdisciplinary collaboration with fields like biology and neuroscience will deepen the study of atomic memory's role in biological molecular structures, genetic information transfer, and nervous system functions. By researching atomic structures and quantum states in DNA molecules, scientists will explore whether atomic memory plays a role in genetic information storage and transfer. They will also investigate the relationship between atomic activity in brain neurons and memory formation or consciousness generation, providing new insights into the mysteries of life and consciousness.

For the reincarnation phenomenon, more systematic research methods will be established. Large-scale case studies and data analysis will help collect more reincarnation-related cases. Statistical methods and scientific evaluation criteria will improve the reliability of the findings. Advanced technologies, such as brain imaging and gene detection, will be used for physiological and psychological tests on individuals claiming past-life memories, exploring potential physiological or psychological traits linked to reincarnation. As consciousness research progresses, future studies will examine the relationship between reincarnation and the continuation of consciousness. Interdisciplinary theories from neuroscience, psychology, and philosophy will explore the origin, development, and evolution of consciousness throughout life and its interaction with the material world. Research into phenomena like near-death experiences and hypnotherapy regression will provide new perspectives on the possible states of consciousness after life, offering theoretical support for reincarnation research.

The study of dreams and multi-dimensional spaces will also become an important focus. With the continued development of virtual reality (VR), augmented reality (AR), and brain-computer interface technologies, scientists will use these tools to simulate and visualize multi-dimensional dream spaces, offering more intuitive methods for dream research. Brain-computer interface technology will enable the conversion of brain electrical signals during dreams into virtual reality scenes, allowing researchers to experience and explore the spatial structures and dynamics of dreams firsthand. To better understand the connection between dreams and multi-dimensional spaces, future research will strengthen interdisciplinary collaboration. By integrating knowledge from physics, mathematics,

psychology, and neuroscience, more refined mathematical models will be developed to describe the spatio-temporal structure and quantum characteristics of dreams. Psychological and neural research will uncover the mechanisms underlying multi-dimensional space experiences in dreams, shedding light on the connection between dreams, consciousness, and cognition. The future research on atoms, consciousness, reincarnation, dreams, and multi-dimensional spaces will be filled with both challenges and opportunities. Through interdisciplinary integration and the application of advanced technologies, breakthroughs in these enigmatic fields will reveal deeper mysteries of the universe and life, ultimately expanding our understanding of ourselves and the world.

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