



# The Ultimate Reality in the Universe: A Study on the Views of Quantum Physics and Vedanta Philosophy

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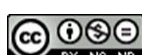
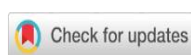
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## ABSTRACT

The majority of quantum mechanics' founding fathers were sensitive to the philosophical implications of quantum mechanics. The theories of relativity developed by Einstein also turned out to have philosophical implications. Although quantum physics could seem enigmatic, it explains everything in our environment, whether we are aware of it or not. Using the abilities of quantum physics results in the expansion of innovative technologies, both for use now and maybe in the future. Everything is explained by quantum physics, which provides the greatest description we currently have of the nature of the particles in the cosmos. The efforts to explain the universe in terms of quantum physics, which regulates the behaviour of the subatomic, microscopic world, are presented in Quantum Universe. It shows a revolution in quantum physics as well as a quantum leap in our understanding of the universe's mystery and beauty. Quantum physics is trying to find a common singularity for all objects. They are trying to discover the 'Theory of Everything, that will explain everything in this universe. Vedanta and Quantum Physics both are looking for the same underlying reality and searching for the absolute truth in the universe, though their approach to searching is different. This paper will attempt to concentrate on the perspectives of Quantum Physics & Advaita Vedanta about the ultimate reality in the universe, the nature of consciousness.

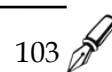


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## INTRODUCTION

The nature and behaviour of matter as well as energy at the atomic & subatomic levels are explained by quantum physics. Unpredictable behaviour is shown by subatomic particles. Quantum physics strives to offer an explanation that is grounded in science and backed by experiment (Drummond, 2019). A particle may be a "wave" or a "particle" depending on the situation. The field of quantum physics was launched by this finding. Over the last century, quantum physics has investigated this contradiction. Several questions were effectively addressed, but with each response, new questions arise, thus the search for answers does not seem to be over. Science cannot and will not provide answers to some issues (Frauchiger & Renner, 2018)

Vedanta and quantum mechanics could seem extremely distinct. One is a part of the scientific tradition, while the other is rather philosophical (Duquette, 2011). Vedanta explores the depths to identify the "subject inside", who is interacting with this universe, whereas science focuses on the universe "out there". The observer and the outside world are both parts of the universe. Everyone agrees that there is only one universe; both "out there" and "in here" are components of the same universe. If this is true, both should have the same fundamental



reality (Chopra, 2019). If you are a part of the universe, then your fundamental reality should be similar to that of the universe 'out there. For the same universe, there could not be two separate realities.

Both science and Vedanta seek the same fundamental reality. In addition, they have commonalities that will be explored in this paper. The objective is the same, but science and Vedanta use quite different approaches to achieving it. Science first began by studying all of the "out there" items in the universe—their functions and materials. Scientists desired to learn more about these items and comprehend the universe's fundamental components as their grasp of science advanced. They began searching inward from molecules, progressed to atoms, subatomic particles, quarks, and strings, and are now seeking the unifying force that serves as the universe's fundamental building component (Glattfelder, 2019).

The "Theory of Everything" or the singularity, which is the fundamental fact of the universe, is the unifying force that science has discovered (Waugh, 2022). Why would this be? Vedanta takes a different method, it began exploring 'in here,' and the ancient Rishis discovered that the one unifying force is inside themselves, while science and quantum physics have hit a wall at this point. They realized that the fundamental reality of the cosmos is this one unifying power. On the basis of this, they postulate that the physical cosmos we see results from the division of this unified reality into an unlimited number of distinct items. Science first looked "out there" before turning within to discover the fundamental truth (Maxwell, 2014). To comprehend the universe, Vedanta first began "in here" and then expanded outward. Therefore, it would seem that science and Vedanta are seeking the same fundamental reality. Heisenberg, Schrödinger, and Bohr all often read Vedic literature. According to Heisenberg, "people who have studied Vedanta will not find quantum physics to be ridiculous". The conclusion of Vedic philosophy is Vedanta.

## RESEARCH METHOD

This study employs a descriptive qualitative research method in a literature review, analyzing linked books on Quantum Mechanics and Vedanta Philosophy, as well as research articles published in journals on the subject. A qualitative-quantitative combination research design (mixed method) was employed in this erudite study, along with exploratory research design methodologies. This inquiry is also known as revelatory research. Revelatory research is one of the erudite literary studies conducted on Vedanta Philosophy and Quantum Physics books and journals pertaining to specific issues. The literature and writings that are closely related to the concerns mentioned were studied as part of the research technique. The exploration system used is by studying the literature and jottings that are nearly applicable to the issues raised. Sources of data are Literature reviews, books, and library exploration. In this case, it can be from the results of former exploration, papers as well as works both published or not. This study uses data collection ways with attestation styles, videlicet by studying colorful documents related to all the data to be studied (Bungin, 2010). The logical fashion used is the inductive thinking fashion, which is a process of organizing a fact or the result of an observation from a separate reality or a conception (Azwar, 2009). Eventually, deducible thinking fashion is the contrary of inductive, which means concluding the relationship from a conception into separate points (Azwar, 2009).

The exploration inflow map: Problems Raised → Relating sources of information's → Gathering being data → Normalizing data → Assaying data → Data collection → Data reduction → Data vindicating → Conclusions.

## RESULTS AND DISCUSSION

### Quantum Mechanics - A Brief Overview

Physics is the most important part of science because all the other sciences and all of the engineering sciences are based on it. The goal of physics is to understand the nature of reality as it exists in the physical world. All scientific investigations strive to grasp the fundamental rules



of the forces as well as phenomena of nature and to unearth specific mysteries about those forces and phenomena. Classical mechanics and Quantum mechanics are the two main branches of Physics. Among the most amazing inventions of the 20th century is quantum physics.

Newton established classical physics and is credited with several discoveries and rules that still hold today. The macro-things we could see around us were the focus of Newton's laws rather than items at the atomic level. Based on these rules, people thought the universe was a huge machine whose motion could be readily predicted for the planets and other celestial bodies. With complete knowledge of what was taking on in the cosmos, scientists were able to anticipate some of the celestial bodies' future motions. The belief among physicists was that there was nothing new to learn about the universe (Heilbronn, 1968).

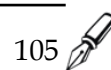
The Research took a dramatic turn in the early 20<sup>th</sup> century. Using modern gadgets and intellectual mathematics, scientists conducted experiments in physics to understand molecules, atoms, and subatomic particles. Researchers in physics discovered that none of the classical rules applied to atomic- and subatomic-level particles. The subatomic level is queer. Because it was discovered that light is composed of quanta, or "packets of energy," physicists gave it the name quantum. Classical Mechanics became out of date at the atomic & subatomic levels. Quantum physics was developed to comprehend and account for events that take place in the subatomic world (Fernandez, 2006).

The behaviour of the subatomic particles is unpredictable. The goal of quantum physics is to provide a thorough explanation that is based on fact and backed by evidence from experiments. A particle may be a "Wave" or a "Particle" depending on the situation. This finding served as the impetus for the development of quantum physics. Over the last century, this paradox has been studied in quantum physics. The unpredictable behaviour of light led to many unexpected findings that eventually gave rise to quantum theory (Wolchover, 2021).

In 1805, Thomas Young demonstrated that Light was a wave in his double-slit experiment. A classic double-slit experiment showed that everything 'out there is in a waveform including electrons which collapse to become particles when observed (Augusto, 2015). For the first time, the observer became essential for the experiments. A report on the "Photoelectric Effect" phenomenon, which demonstrated that light is a particle, was published by Einstein in 1905. For this discovery, Einstein received the Nobel Prize in 1921. When Max Planck attempted to comprehend the emission of energy from a black body, he also discovered the emission of photons or discrete packets of energy.

A bold claim that all matter should possess both "wave" and "particle" qualities were made in 1923 by de Broglie, a French doctorate student. Any object in this universe, whether it is alive or not, is considered to be matter in this context, including you, me, planets, vehicles, and so on. Since the tree in front of you is a particle, you may determine its wavelength based on its energy content by using the de Broglie formula. Experimental evidence supporting the de Broglie theory was obtained in 1927; as a result, all matter is both a wave and a particle (Jeong, Yin & Datta, 2013) De Broglie received the Nobel Prize for his hypothesis in 1929. The only person to ever win a Nobel Prize based on a Ph.D. thesis was him. Werner Karl Heisenberg, a German theoretical physicist, received the Nobel Prize in Physics in 1932 "for the development of quantum mechanics".

The Austrian-Irish scientist Erwin Schrodinger won the Nobel Prize for a variety of important quantum theory discoveries, such as the Schrödinger equation, which could be utilized to determine how a system's wave function evolves dynamically over time. Schrodinger's wave function is the core of quantum physics, just as Newton's rule of motion is the core of classical physics. Schrodinger developed a challenging equation for the wave function to comprehend the "wave" portion of the de Broglie theory. How this works when a quantum object is related to a more familiar item was explored by Schrödinger's thought experiment. In his mind, a box contained a cat, a bottle of poison, and a radioactive atom. The radioactive atom may either decay or not at any given time according to quantum laws. There is



no way of knowing when it will happen, but when it does, the vial cracks, the poison spills out, and the cat dies (Monte, Brenno & Carlo, 2020).

To reflect the probabilistic aspect of quantum processes, mathematics is also required. For instance, it's possible that an electron's location is not precisely understood. Instead, it could be seen to be in a variety of potential places (like within an orbital), with each place having a chance of having an electron there. Due to their probabilistic character, mathematical "wave functions," which are answers to the Schrödinger equation, are often used to explain quantum objects. An observation system and an observing system are represented by the Schrodinger wave function. A waveform depicting small or large items makes up the observed system. The observed collapses into a particle in the existence of the observing system (Faye, 2019).

Superposition is a term used in quantum mechanics to define an object as a combination of many possible states at once. The surface ripple of a pond, which is composed of two overlapping waves, is similar to a superposed object. To represent an item in superposition, a mathematical equation with several possible outcomes or solutions might be utilized. A trade-off between opposing viewpoints is represented mathematically by the uncertainty principle. As a result, an object's location and velocity, for example, cannot be accurately determined at the same time in physics. The degree of precision with which we can determine an electron's speed, for instance, will be constrained if we accurately measure an electron's location. 'Quantum Entanglement' is another weird proposition of Quantum Physics where two synchronized particles, when separated, keep their connection intact. One particle immediately reciprocates any change made to the other particle (Wang, 2021). In that case, are these two particles invisibly connected? Are we all interconnected at the quantum level? The Big Bang happened 13.7 billion years ago, as per science. One of the most important questions is what was there before the big bang? What existed when  $t = 0$ ?

Numerous questions have been satisfactorily addressed, but with each response, new ones arise, thus the hunt for answers continues. Niels Bohr Stated, "Quantum theory has not been comprehended by anybody if they are not shocked by it." Despite its mysticism, quantum science defines everything around us, whether we realize it or not. New technologies are developed as a result of utilizing quantum physics, both for current uses and potential ones in the future (Beller, 1999).

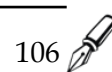
## **Vedanta Philosophy**

### **a. Vedanta Philosophy and Upanishad**

The Upanishads are a set of Sanskrit texts that were passed down orally from teacher to pupil over a long period of time. The Upanishads are related to the nature of reality, thought, the self, and consciousness, while the Vedas recommend rites to please the gods. All Indian philosophical traditions are said to have culminated in Advaita Vedanta. This Vedantic school was founded by Adi Sankaracharya, whose followers include Swami Vivekananda, Sarvopally Radhakrishnan, and other individuals who have lucidly described the concepts of awareness and the self.

The link between the Atman and Brahman is discussed in the Vedanta and Upanishads. The ultimate single reality or the universal self is known as Brahman. The soul or inner self of a person is their atman. The Upanishads' core doctrine is "*tat tvam asi*" which denotes that the Atman and the Brahman are one and the same. We are each a part of the same universal self. According to Isha Upanishad, "Everything alive or not is created by the Brahman; a knowledgeable man understands that he and all other creatures are the same (Shankaracharya, 1965)."

Only Brahman exists, according to the Vedanta and Upanishads. Everything we experience is Maya, a distortion of the Brahman resulting from our ignorance & limited senses. According to the Chandogya Upanishad, "All is Brahman. Everything originates from Brahman, returns to Brahman, and is supported by Brahman". According to Vedanta philosophy, consciousness gives origin to reality. However, our bodies do not contain



consciousness as a material or an organ. Consequently, how can a non-material awareness connect with and regulate our material bodies? Where exactly does the mind engage with the material? This question, recognized as the problem of mind-body, has long perplexed philosophers (Penrose, 1994).

**b. Hagiography of Adi Shankaracharya**

The great Indian philosopher, Vedic scholar, and teacher Sri Adi Sankaracharya were born in India in 788 AD at Kaladi (Kerala). At a very early age, he gave up worldly pleasures and became an ascetic. Many people believe Shankara as a reincarnation of Shiva. Shankara's mother educated him since his father passed away when he was just seven years old. His mother, Aryamba was crucial in Shankara's education in the Vedas and Upanishads. Shankara went on to become a monk at a very early age and then he searched for Guru. According to some ancient texts, a young Shankara travelled at least 2000 kilometres before meeting his Guru, "Govinda Bhagavatpada" on the banks of the Narmada River under whom he studied for four years. Under the direction of Govinda Bhagavatpada's, Shankara examined "Gaudapadiya Karika", "Brahmasutra", Vedas, and Upanishads, the profound philosophy of Advaita. Shankara quickly attained proficiency in almost all of the ancient scripts, which amazed his teacher. His Guru, Govinda Bhagavatpada, even encouraged him to write a "philosophical commentary" on the Vedanta Sutras, commonly referred to as the Brahma Sutras (The Theory of Supreme Being), and he even began writing a commentary on important religious texts. Sankara later travelled to Varanasi where he authored a commentary on the Bhagavad Gita, Upanishads, and Brahma Sutras (Das, 2021).

Sankaracharya started traveling across India, propagating 'Advaita Vedanta'. He made three round trips across India on foot, from Nepal to Rameswaram, spreading the global Advaita philosophy at revered learning centres, holy sites, and kings' capitals. Several philosophers and scholars disagreed and challenged with Shankara's teachings throughout his journeys. Even though he participated in several discussions on Hinduism and its principles, Shankara managed to confound all of his critics with his knowledge and lucidity. He immediately set about spreading his beliefs, and soon several people began to see him as a guru. During his travels, he had many academics as disciples, such as Sadananda, Bramendra, Prthividhara, Citsukha, Tothaka, Sureshvara, and Padmapada others who wrote their works on Sankara's Advaita Vedanta. The old "Advaita Vedanta" doctrines were combined by Shankaracharya, who also clarified the fundamental concepts of the Upanishads. He promoted Hinduism's earliest doctrine, which describes the unification of the soul (atman) and the Supreme Soul (Nirguna Brahman). He was given credit for creating, consolidating, and rejuvenating the Sanatana Dharma. Although Shankaracharya firmly believed in traditional Hinduism, he detested the "Mimamsa school of Hinduism" since it was only dependent on ritualistic rituals. Sankaracharya, a great thinker, and passionate debater harmonized the competing sects that were prevalent at that period. Four monasteries (Mathas) were established by Shankaracharya to carry on his teachings (Pathak, 2016, Kaipayil, 2020).

The majority of the traits of Shankara's philosophy, in Nakamura's words, "were articulated by someone before Sankara," when compared to the known teachings of the early Vedanta. The *Advaita-Vedanta*, which was already there before Shankara, was combined by him. Koller claims that Shankara systematized the basis for Advaita Vedanta in the eighth century, modifying Badarayana's Vedanta tradition, and employing concepts from ancient Indian scriptures. Mayeda claims that Shankara marks a turning point in the evolution of Vedanta, but he also observes that Shankara "has usually been regarded as the greatest philosopher of India." Mayeda goes on to say that Shankara was mainly focused on moksha and was not concerned with the establishment of a comprehensive system of philosophy or theology, in line with Potter, who labels Shankara a "speculative philosopher." He was a fully developed soul who was also an organizer, guru, philosopher,

scholar, poet, and social and religious reformer all wrapped into one. In 820 AD, he died in India's Kedarnath at the age of 32 (Whitehead, 2019).

### **Unification - The Ultimate Goal of Quantum Physics and Vedanta Philosophy**

The world according to quantum physics is both waves and particles. How can it be both? What happens to the wave when it becomes a particle? Does it move into another dimension? We have no answer from science, yet. Vedanta however calls this phantasmagoria 'Maya' (Ball, 2018). This is quite similar to Vedanta in several aspects. Vedanta says that the mind is formed of waves, or "vrittis", and that these mind waves transform into objects ("Gagata," in Vedanta), which we perceive all around us in this physical reality. Are the "waves" that quantum physics describes the same as the "waves" that exist in the mind? Second, the core of quantum physics is Schrodinger's wave function. In Vedanta, the observing system (Drashta) and the observed system (Drishya) make up the physical system that Schrodinger's equation represents. The wave function that represents the observable system is the wave part of de Broglie's proposed wave/matter duality. A wave function collapses and transforms into a particle only in the presence of an observation system. The particle will remain a wave (double slit experiment) if there is no observer. Similar to this, Vedanta claims that this Srishti or Drishya (Observed system in Quantum Physics) only appears or exists because of the Drashta (Observing system in Quantum Physics). An observer in Vedanta is Atman or Brahman and the observed system in Vedanta is Drishya or Maya or Jagata (world). Quantum physics and Vedanta have this common basis (Dusek, 2015).

Erwin Schrödinger was quite a lot influenced by Vedanta. He has quoted "the multiplicity is only evident. This is the Upanishads' philosophy. Not only of the Upanishads. Unless strong preconceptions prevent it, the mystical experience of union with God often results in this perception" (Bitbol, 1996). "Only the solitary is ever experienced when it comes to consciousness. None of us has ever had more than one consciousness, and there is no circumstantial proof that this has ever occurred anyplace on the globe. It appears like a straightforward tautology if I argue that there could not be more than one awareness in a single mind since it is difficult to imagine the opposite." The individual mind as well as the cosmic mind function as Schrodinger's wave equation. The waves occurring inside the mind are therefore represented by Schrodinger's wave equation. Schrödinger first encountered Indian philosophy around 1918 through the writings of the German philosopher Arthur Schopenhauer. Schopenhauer, a devoted student of the Upanishads said "In the whole universe, there is no study so useful and so uplifting as that of the Upanishads. It has been the solace of my life. It will be the solace of my death." Schrödinger described a universe in which wave functions serve as the representation of particles (Bitbol, 2020). "Wave mechanics exhibits both unity and continuity, which are represented in Vedanta. The Vedanta idea of the All-in-One is fully supported by this." Heisenberg quoted, "People who have studied Vedanta will not find quantum physics to be ridiculous. Vedanta is the conclusion of Vedic thought". Heisenberg quoted, "Some of the concepts that had once appeared so ridiculous suddenly made a lot more sense after our discussions with Tagore. That was helpful to me."

Neils Bohr, one said something to the effect "Those who say they understand Quantum theory have not understood it all". - something similar is said about Advaita Vedanta. Kena Upanishad quoted, "I cannot say that I know Brahman but I cannot say that I don't know either". "Only the multiplicity is seen. This is the doctrine of Upanishads. And not only from the Upanishad. This mystical experience of the oneness with God often results in this viewpoint unless strong preconceptions prevent it", said Schrodinger. This idea is expressed repeatedly in the Vedanta as 'Advaita' and Advanta' that is, "not dual and only one". For more than a century, philosophers, theologians, and mystics have been fascinated by the reflective nature of quantum physics. Quantum physics is categorical proof that this human thought process is still valid even 10,000 years after the ancient cultures used them, as they did so without being aware of the quantum universe (Adam, 2019).

As per the quantum theory, even if we are not speaking or looking at each other, you and I still have an impact on one another. This is because quantum mechanics contradict objectivity, which in turn denies each of us an absolute status. The universe is a unique entity. A comparable result was obtained in Vedanta philosophy over a thousand years ago, a well-known Vedanta scripture writes: "*drsyah dhi brttayah saksi drg eva na tu drsyate*". "All of the sights in front of us are projections of our intellect, and the Self, which is our own pure awareness, is the one who sees them. Since the self is the Seer, it could not be seen (Tathagatananda, 2023; Sarkar, 2021). All that is to be known as an expression of the mind, as the mind is what needs to be understood", Says the Brhadaranyaka Upanishad [1:5:9]. According to the Isha Upanishad, "the Brahman creates everything, whether it be living or non-living. The wise man realizes that all creatures are identical with himself and that he is the self of all beings."

## CONCLUSION

Nowadays it is challenging research to correlate the ancient Indian Vedantic philosophy of Adi Sankara with the modern Quantum Physics of Einstein, James Jeans, Max Born, Niels Bohr, Arthur Eddington, Schrödinger, Dirac, and Heisenberg, and many more. Every object possesses wave-particle duality, according to quantum physics, which means it is both a wave and a particle. In Vedanta, it is referred to subtle and gross duality. The physical cosmos is the gross body, while the mind is the subtle body, a pool of waves. Even the Schrodinger wave equation refers to "vrittis" or mental waves. Nothing other than Atman, which is the fundamental reality of everyone, is the observing system that causes the Schrodinger probability wave function to collapse. In the existence of Atman, all of the mental wave's collapse. Quantum mechanics proposed that conciseness is the only reality in the universe whereas Vedanta concluded that only Brahman is the absolute reality. It suggests that consciousness may be explained by quantum-mechanical phenomena like entanglement and superposition, which may have a significant impact on how the brain works. Vedanta concluded that Para-Brahman is the source of the creation and dissolution of the universe. Jivatma is nothing but a soul separated from Brahman and must try to merge with Brahman called moksha. Because senses are confined, Brahman cannot be experienced via them. While quantum physics concluded that atoms bind together to form planets, stars, and comets before disintegrating and merging with consciousness throughout time. Everyone who was once part of one consciousness later separated and has to integrate back into that consciousness. Infinity cannot be understood with a finite medium. This leads us to the conclusion that Vedanta and quantum physics are discussing the same fundamental reality. Although we are all the same consciousness, we all seem to be distinct due to our activities. Shankara only said the phrase, "*Brahma satyam jagat mithya, jivo brahmaiva naparah*". The observed is an illusion; Brahman is the sole reality and truth; a living being is identical to Brahman, who has disclosed the deepest knowledge. The Upanishads themselves advocate for equality and condemn all forms of prejudice. According to Isha Upanishad, "Who sees all creatures in their self and their self in all beings, remove all hatred and fear." We anticipate and hold out hope that the findings of Advaita Vedanta and quantum physics will finally coincide within consciousness, the ultimate reality.

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