

# The Role of Dialectical Forces in Quantum Physics and General Relativity

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## Abstract

The following manuscript establishes the role of dialectical forces in our physical universe. The dialectical relationship links opposing theories of quantum mechanics and bridges the gap between quantum physics and general relativity.

*Index Terms* - dialectical theory, quantum mechanics, quantum physics, relativity, unified theory.

## 1 Introduction

The most commonly held interpretation of quantum mechanics is the Copenhagen Interpretation [1]. In the Copenhagen interpretation, a quantum system remained in a state of superposition, a state of existing in all possible states at once, until it interacted with, or was observed by, the external world, at which time the superposition collapses into one or another of the possible definite states. In other words, reality is subjective. This interpretation was challenged by Schrodinger who placed a cat in a locked chamber, whose life or death randomly depends on the state of a radioactive atom, whether it has decayed and emitted radiation or not. Here, the cat in a closed box was either alive or dead independent of an outside observer. Schrodinger's cat thought experiment remains a defining benchmark for modern interpretations of quantum mechanics. The following paper will solve the dilemma of Schrodinger's cat in a box, illuminate how reality is created, and explain the contradictions between quantum physics and relativity.

## 2 Research

Georg Wilhelm Friedrich Hegel is one of the greatest systematic thinkers in the history of Western philosophy [2]. Hegel identified three stages of development in the dialectical force. First, there is a *thesis*, giving rise to its reaction. Every action has an equal and opposing reaction. Therefore, the second stage is the development of an *antithesis* which, while sharing common traits, contradicts and opposes the thesis. Third, as two opposing forces come together, they create a distinct, new group which resolves the tension between the two by means of a synthesis. This synthesis solves the conflict between two opposing forces, a thesis and antithesis, by reconciling their common truths and forming a new thesis, starting the process over again. There are three (3) principles of dialectical relationships.

First, *two opposing forces can both be true*. Everything is composed of contradictions or opposing forces. This is supported by Copenhagen's interpretation that opposing forces can exist simultaneously in a state of superposition. According to the principle of polarity, reality is not static, but is comprised of opposing forces, ("thesis" and "antithesis"), out of whose integration ("synthesis") evolves a new set of opposing forces. "Truth is paradoxical. Contradictory truths do not necessarily cancel each other out or dominate each other, but exist side by side, inviting participation and experimentation." (Goldberg, 1980). One does not exist without the other.

Second, *everything is connected in some way*. This is supported by quantum physics which states that at the core of all atoms are electrical particles, atomic energy or waves which are always meeting and getting entangled with each other (quantum entanglement). According to the principles of interrelatedness and wholeness, each part of a system is of limited value unless the analysis relates the part to the whole. Thus, identify and boundaries between parts are temporary and exist only in relation to the whole. "Parts and wholes evolve in consequence of their relationship, and the relationship itself evolves. One thing cannot exist without the other, that one acquires the properties from its relationship with the other, and the properties of both evolve as a consequence of their interpretation." (Levins and Lewontin, 1985).

Third, *change is the only constant*. Change is transactional with both forces reciprocally affecting or influencing each other. The tension between the thesis and antithesis forces within each system produces change. The new state following change (the synthesis) is also comprised of polar forces, and thus change is continuous.

### 3 Methods

This thought experiment is an extension of Schrodinger's cat in a box. It begins with two dialectical relationships: The relationship between **life and death**, and the relationship between **objectivity and subjectivity**. They come together to form *four* (4) separate, possible states of reality: the cat is *objectively alive*; the cat is *objectively dead*; the cat is *subjectively alive*; the cat is *subjectively dead*. As the opposing forces continue to come together, they create *thirteen* (13) possible states of reality. Some exist in a state of quantum superposition. (Figure 1)

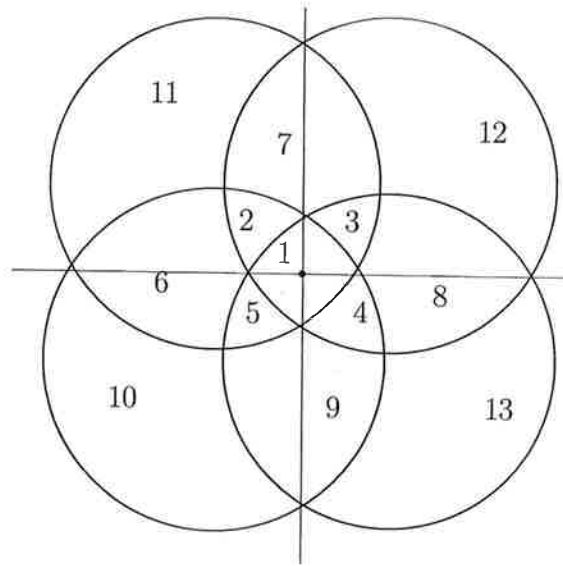


Figure 1: Possible States of Reality

(13) Dead, (12) Objective (the cat's state in a closed box), (11) Alive, (10) Subjective (the cat's state as observed from outside the box), (9) Subjectively dead, (8) Objectively dead, (7) Objectively alive, (6) Subjectively alive, (5) Subjectively alive and dead, (4) Objectively and subjectively dead, (3) Objectively alive and dead, (2) Objectively and subjectively alive, and (1) All possible states at once.

## 4 Results

In dialectical relationships, opposing states resolve the tension between them by means of a synthesis. This synthesis solves the conflict between two opposing forces by reconciling their common truths. Let's assume the cat is alive in a closed box. There are seven (7) states where the cat can be alive: 1, 2, 3, 5, 6, 7 and 11. This includes: all possible states at once, objectively and subjectively alive, objectively alive and dead, subjectively alive and dead, subjectively alive, objectively alive, and alive. There are seven (7) states where the cat can be in a closed box: 1, 2, 3, 4, 7, 8 and 12. This includes: all possible states at once, objectively and subjectively alive, objectively alive and dead, objectively and subjectively dead, objectively alive, objectively dead, objectively. Common truths between the state of being alive and objectively being in the box are states 1, 2, 3 and 7: all possible states at once, objectively and subjectively alive, objectively alive and dead, objectively alive. If we were to reconcile the common truths between these four states, the result would be that cat is objectively alive in the closed box.

Let's assume the cat is both subjectively and objectively alive. There are seven (7) states where the cat can be alive: 1, 2, 3, 5, 6, 7 and 11. This includes: all possible states at once, objectively

And subjectively alive, objectively alive and dead, subjectively alive and dead, subjectively alive, objectively alive, and alive. There are seven (7) states where the cat may be observed subjectively from outside the box: 1, 2, 4, 5, 6, 9 and 10. This includes: all possible states at once, objectively and subjectively alive, objectively and subjectively dead, subjectively alive, subjectively alive and dead, and subjectively. There are (7) seven states where the cat can be in a closed box: 1, 2, 3, 4, 7, 8 and 12. This includes: all possible states at once, objectively and subjectively alive, objectively alive and dead, objectively and subjectively dead, objectively alive, objectively dead, objective. Common truths between the cat being alive, being observed subjectively from outside the box, and its objective state in the closed box include 1 and 2: all possible states at once, and objectively and subjectively alive. If we were to reconcile the common truths between these two states, the result would be that the cat is objectively and subjectively alive. The fact that the dialectical formula will work for each of the possible states demonstrates that reality is created through the synthesis of common truths between two opposing forces.

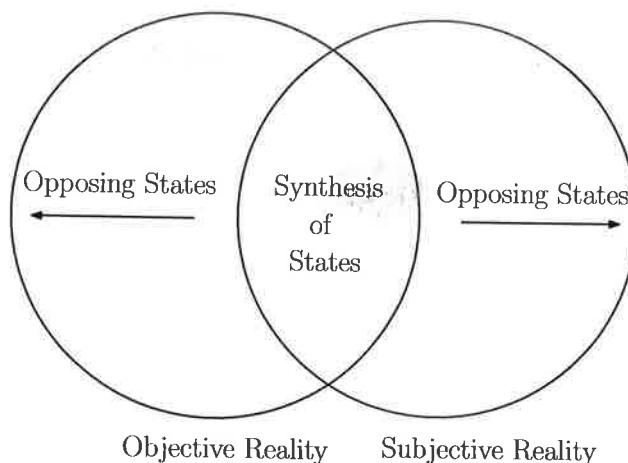


Figure 2: Synthesis of Opposing States

Consistent with dialectical principles, objective and subjective reality:

- 1) oppose each other *and* synthesize together;
- 2) are each separate states *and* part of a greater whole; and
- 3) share a continuous, transactional relationship.

The reality of science is a dialectical dilemma. Science must be regarded within an accepted paradigm. At the same time, science must be open to embracing a shift in paradigm if we are to deepen our understanding of the universe. The dialectical paradigm brings to science what Kuhn refers to as a revolution of change, and with this shift, a long anticipated, more advanced understanding of our universe become possible. For instance, extending the dialectical paradigm in the understanding of our physical reality, quantum physics and relativity also have a dialectical relationship, sharing common, interlocking traits while simultaneously maintaining opposing forces.

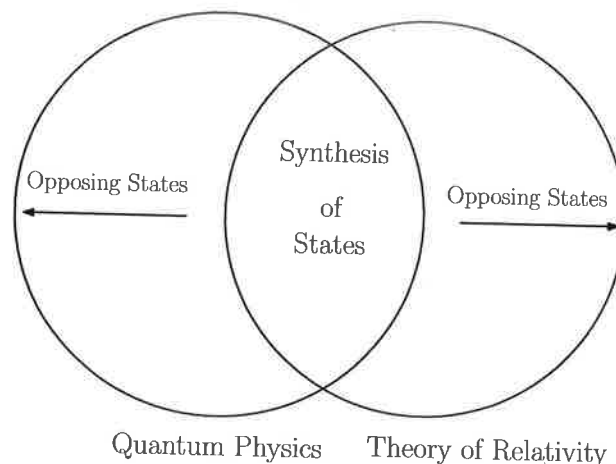


Figure 3: Synthesis of Opposing Forces

To apply the dialectical formula to quantum physics and relativity, we begin with two dialectical relationships: the relationship between **matter** and **energy**, and the relationship between **space** and **time**. As these four states come together, they create *thirteen* (13) possible states of reality, including: (1) all possible states at once; (2) space, time and matter; (3) matter, energy and time; (4) space, time and energy; (5) matter, energy and space; (6) matter and space; (7) matter and time; (7) matter and time; (8) time and energy (9) space and energy; (10) space; (11) matter; (12) time; and (13) energy. (Figure 1)

To randomly identify the state where space meets energy, there are *seven* (7) possible states that contain space: 1, 2, 4, 5, 6, 9, 10 and *seven* (7) dialectically opposite states that contain energy: 1, 3, 4, 5, 8, 9 and 13. The common traits between these two states are state 1 (all possible states); 4 (space, time and energy); 5 (matter, energy and space) and 9 (space and energy). If we were to reconcile the common traits, the result would be space and energy.

As quantum and relativity come together, they create a distinct, new group which resolves the tension between the two by means of a synthesis. This synthesis solves the conflict between the two opposing forces by reconciling their common traits. If we were to reconcile the common traits between quantum physics and relativity, the one common trait which links the two theories is speed. Reconciling the states which contain the common trait of speed result in ten (10) possible states of reality coming together to form states 1, 2, 3, 4, 5, 7, 8, 9, 12 and 13: (1) All possible states at once; (2) space, time and matter; (3) matter, energy and time; (4) space, time and energy; (5) matter, energy and space (7) matter and time (8) energy and time (9) space and energy; (12) time; and (13) energy. According to dialectical principles, reality is created through the synthesis of those opposing states which contain the common trait of speed. (Figure 4).

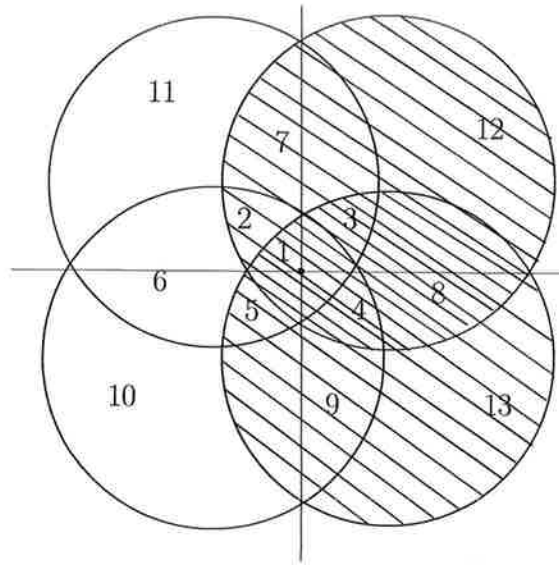


Figure 4: States containing the Common Trait of Speed

## 5 Conclusion

The problem with combining quantum physics and relativity, according to Powell [3], is that relativity gives nonsensical answers when you try to scale it down to quantum size, eventually descending to infinite values in its description of gravity. Likewise, quantum physics runs into serious trouble when you blow it up to cosmic dimensions, piling so much energy in the quantum field that it creates a black hole that causes the universe to fold in on itself. The dialectical relationship, which excludes states 6, 10 and 11 from synthesis, subtracts tiny particles of matter and huge gravitational fields of space, literally bridging the gap between quantum physics and relativity.

Consistent with the principles of Hegel's dialectic, quantum physics and relativity 1) oppose each other *and* synthesis together, 2) are each separate entities *and* part of a greater whole, and 3) share a continuous, transactional relationship. In fact, all the forces which make up quantum physics and general relativity are also created through dialectically opposing forces which intercept to form a distinctive, third group. This includes quantum physics which is created through a synthesis of energy and matter; relativity which is created through a synthesis of time and space; present time which is created through a synthesis of past and future; space which is created through a synthesis of position and direction; matter which is created through a synthesis of particles and antiparticles; and energy which is created through a synthesis of mass (an object resistance to motion) and the speed of light squared (a state of motion). These relationships form a distinctive pattern in our laws of nature, and demonstrate how everything in our universe is connected to create reality (Figure 5).

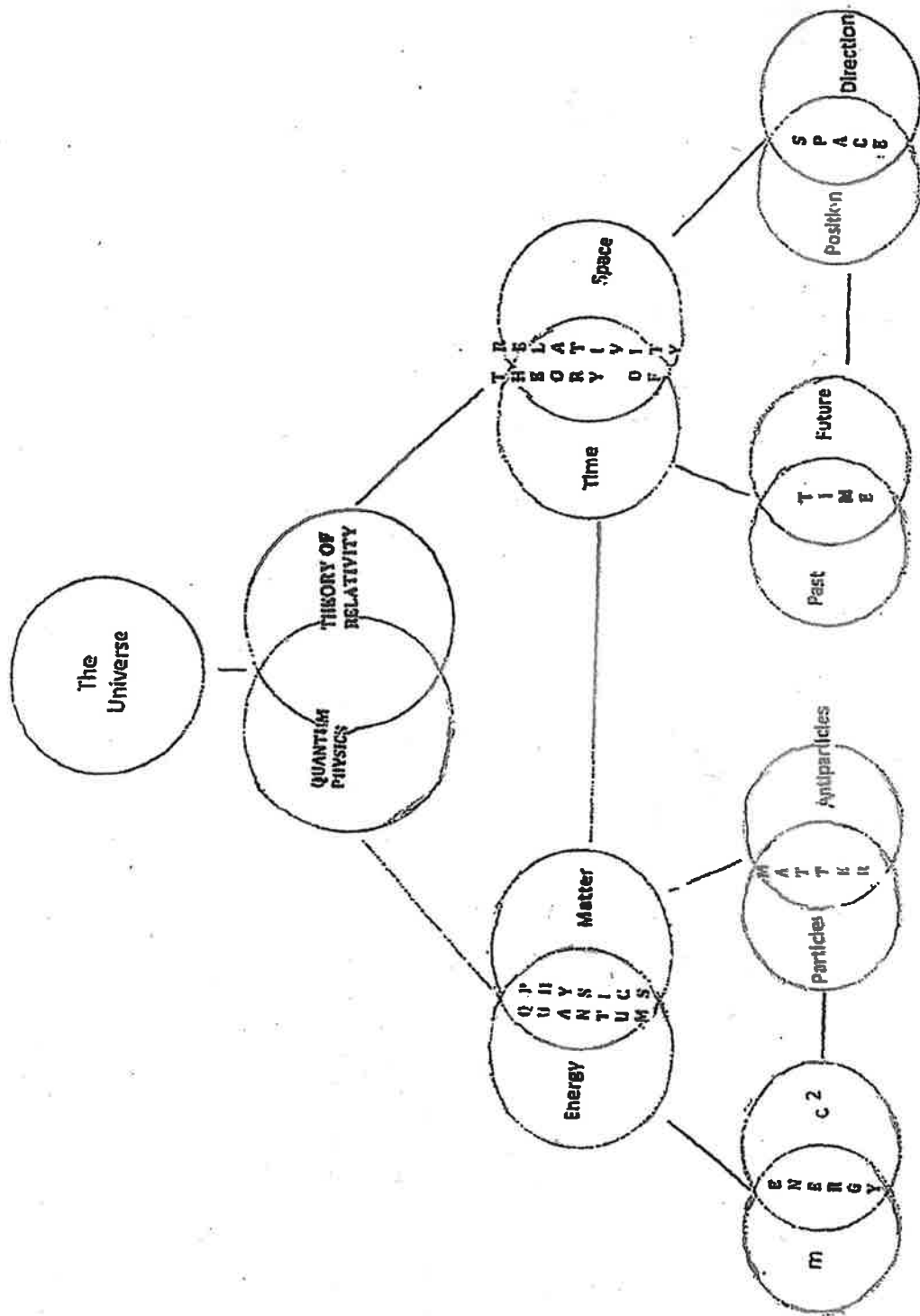


Figure 5: Dialectical Forces of the Universe

Other planes of existence are created through the dialectical relationship, and different planes of existence share a dialectical relationship with each other. For instance, the mental plane of existence is created through the synthesis of common truths between dialectically opposing physical and spiritual planes of existence.

Does the dialectical concept introduce preliminary evidence to the scientific community of the existence and role of dialectical forces in our physical universe, or is it to be regarded as more exasperating, hocus pocus pseudoscience? Wells (1972) has documented a shift toward dialectical approaches in almost every natural science during the past 150 years. A dialectical view figures in various theories of the development of science (Kuhn, 1970). The most widely accepted view of what falls within the purview of the scientific model is best described by Kuhn in *Structure*. “A loosely characterized group of activities, often consisting of competing schools, becomes a mature science when one or more concrete problem solutions provide models for what good research is (or can be) in that domain. These exemplary problems-cum-solutions become the basis of a “paradigm” that defines what it is to do “normal science.” As its name suggests, normal science is the default state of a mature science and of the community of researchers who constitute it. The paradigm informs investigators what their domain of the world is like and practically guarantees that all legitimate problems can be solved in its terms. Normal science is convergent rather than divergent: it actively discourages revolutionary initiatives and essentially novel (unexpected) discoveries, for these threaten the paradigm. However, normal research is so detailed and focused that it is bound to turn up anomalous experimental and theoretical results, some of which will long resist the best attempts to resolve them. Given the historical contingencies involved in the formation of guiding paradigms, as well as the fallibility of all investigators, it would be incredibly improbable for everything to end up working perfectly. According to Kuhn anomalies are therefore to be expected, and all sciences face anomalies at all times. If and when persistent efforts by the best researchers fail to resolve the anomalies, the community begins to lose confidence in the paradigm and a crisis period ensues in which serious alternatives can now be entertained. If one of these alternatives shows sufficient promise to attract a significant group of leading researchers away from the old paradigm (typically by furnishing new potential exemplars that break through the old roadblock to progress), a paradigm shift or paradigm change occurs—and that is a Kuhnian revolution.”

Kuhn argues that the evolution of scientific theory does not emerge from the straightforward accumulation of facts, but rather from a set of changing intellectual circumstances and possibilities. According to Kuhn, the scientific paradigms preceding and succeeding a paradigm shift are so different that their theories are incommensurable – the new paradigm cannot be proven or disproven by rules of the old paradigm and vice versa. The knowledge that is built by science should always be open to question and revision, particularly if the current paradigm does not explain things for which a shift in paradigm clearly would. It is a fundamental foundation upon which all science is based. If that which simply deviates from the most current paradigm is expeditiously written off as “outside our scope” or “unsuitable”, then scientific progress is undoubtedly thwarted. Does a mathematically sound theory which can unify quantum and relativity rise to the occasion of a revolutionary shift in paradigm predicted by Kuhn? That is best left to the scientific community at large to decide. But I would argue that enough evidence exists to suggest that dialectical forces are at the forefront of our scientific



evolution. Alternatively, the significance of these early findings merits more rigorous research by the scientific community in order to further assess the validity of any conclusions.

The universe exists through all things being interwoven within dialectical forces. Life is literally created through the synthesis of common truths between dialectically opposing male and female counterparts. The dialectical relationship links opposing theories of quantum mechanics. Moreover, dialectical theory bridges the gap between quantum and relativity, offering a new, grand unified theory.

## 6 Acknowledgment

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### Author's Note

Tracy Klein is a dialectical behavior specialist. She has received extensive training in dialectics at the Marsha Linehan Institute. Her training has been and continues to be supported by the Center for Behavioral Health at Memorial Regional Hospital where she provides dialectical behavior therapy.