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**Research Article**

# The New Reinvention Approach: Schrödinger's Cat and Chan Laoer's Principle (陳老 2 的狗定理)

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**Abstract**
Quantum entanglement is a highly unusual phenomenon in physics where two particles become linked, so their states are correlated regardless of the distance separating them. For example, with two entangled electrons, measuring the spin of one instantly determines the spin of the other, even if they are separated by vast distances, like one on Earth and the other on the far side of the universe. These entangled particles behave as a single system with interconnected properties, despite no physical contact. Albert Einstein famously referred to it as 'spooky action at a distance,' because it seems to defy the conventional laws of physics. In this research paper, we would like to discuss our reinvention assumption, called "Chan Laoer's Principle", to bridge the gap between the classical physics approach and the quantum physics approach. We hope this research paper can contribute to the academic field of physics.
**Keywords:** Schrödinger's Cat, Schrödinger's Equation, Chan Laoer's Equation, Chan Laoer's Principle.

## Introduction

Einstein said, "God cannot throw the dice", he wouldn't believe that God can play dice. In the research paper, he writes about the EPR paradox in 1935, Albert Einstein (1935), laid the foundation of the quantum entanglement problem, which he describes as a seemingly spooky action at a distance.

Bell's (1964) laid the groundwork for the information paradox, which postulates that the quantum entanglement phenomenon may occur, and it will upheaval the relativities at the first level.

This research paper hope to bridge the gap in between the quantum physics and classical physic, through an thought experiment, which hopefully can explain part of the problem of quantum entanglement and the dual co-existing factor which is Zero and One that may coupling in the same coincidence through the famous Schrodinger cat experiment, we reinvented and reinterpretation by our reinvent model of the 'Chan-second-dog' " Chen Lao 2's dog" thought experiment.

## Discussion

Quantum entanglement is a non-classical correlation phenomenon observed in quantum physics, where the quantum states of two or more particles become intrinsically linked such that the state of each particle cannot be described independently of the states of the others, regardless of the spatial separation between them. This phenomenon occurs due to the entanglement of the particles' wavefunctions, resulting in a joint quantum state that encapsulates their combined properties. For instance, consider a pair of spin-entangled electrons: measurement of the spin state of one electron along a specified axis instantaneously determines the spin state of the other electron along the same axis, even when the particles are separated by vast distances. Such correlations have been empirically validated through numerous experiments, including Bell test experiments, which have closed various locality and detection loopholes. Notably, experiments have confirmed entanglement over distances more than 1000 kilometers, utilizing satellite-based and fiber-optic communication channels. Albert Einstein famously referred to this phenomenon as "spooky action at a distance" due to its apparent contradiction with the local realism principle underpinning classical physics. Nonetheless, quantum entanglement remains foundational in advancing quantum information science, including quantum computing, quantum cryptography, and quantum teleportation.

Famous physicist Neil deGrasse Tyson explained that quantum entangled particles are pairs that 'know' about each other, even when separated in space and time (Tyson, 2022). When you observe one particle, the other's state changes instantly, regardless of the distance-almost as if they communicate faster than light. However, the term 'observe' doesn't imply a psychological process; in physics, it refers to measurement requiring interaction. For example, if an electron is on this table and the lights are off, I might say, 'I believe there's an electron here.' Turning on the lights causes a photon to interact with the electron, moving it somewhere else (Tyson, 2022).

Olivia Lanes from IBM quantum emphasize the importance of the 2022 Nobel Prize in Physics to John Klauser, Alain Aspect, and Antoine Sellinger for pioneering quantum mechanics experiments, building on John Bell's original work. She focuses on interpreting why Bell's theorem experiments are significant. Which argued that quantum mechanics might have room to come. When the wave function contains all properties of a quantum system, collapsing upon measurement into a single outcome, changing from probabilistic to definite. Einstein believed this collapse showed quantum mechanics was incomplete because it involved unacceptable elements. Either a fundamental part of reality was missing or the theory was incomplete. It indicated current quantum understanding still had gaps (Lanes, 2022).

Since, Bell's theorem, demonstrating that assuming local realism no-faster-than-light travel and realism-objects having definite properties-leads to certain limits. His derivation showed classical physics predictions under local realism couldn't explain quantum phenomena. Later, John Clauser tested Bell's theorem experimentally, and his experiment confirmed violations of the inequality, supporting quantum theory. So, in other words, that means, in essence, Einstein was unfitting in ER paper, which led to groundbreaking work later by Alice Aspect, who performed more tests of Bell's inequality and closed loopholes. This progress then paved the way for Anton Zellinger, who was able to demonstrate quantum teleportation for the first time.

Quantum teleportation is a method to entangle or correlate quantum particles so that you can transfer quantum information from one to another. It's a way to entangle or correlate quantum particles so you can transfer quantum information from one to another. A specific demonstration of Bell's tests focus on one: the CHSH test, or the CHSH inequality. Imagine Alice and Bob standing some distance apart, and a third person, Victor, in the middle. Victor sends a particle to both Alice and Bob simultaneously. Each measure either the X or Z projection of the particle whenever this occurs. The experiment with Alice and Bob each receiving a particle that has a fixed value of 1 or -1, normalized.

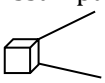
Under local realism, these particles don't travel faster than light, and Alice and Bob can't communicate faster than that. The CHSH value is calculated from their measurement products: Alice's X times Bob's X, plus Alice's X times Bob's Y, plus Alice's Y times Bob's X, minus Alice's Y times Bob's Y. The derivation shows we can factor out Alice's measurements, indicating the value in each run will be 0 or based on measurement outcomes (Lanes, 2022).

So, in order to bridge the gap between traditional physics and quantum physics, our research focuses on reinvent and reinterpretation of the Schrödinger equation. That way, we may find a clue that might solve the aforementioned paradox.

**Insight and New Suggestion**
**The Traditional Schrodinger Equation**

$$i\hbar\frac{\partial}{\partial \mathrm{t}}\Psi(x,t) = \frac{\hbar^2}{2m}\frac{\partial^2}{\partial x^2}\Psi(x,t) + V(x)\Psi(x,t)$$

Assumption: Let say the cube is in the form of an acceleration like the space of the universe



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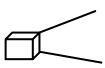
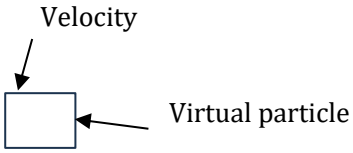
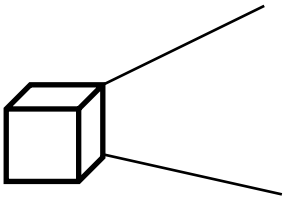
$F =$ 

**The New Reinvented Schrodinger and Chan Laoer's Equation**

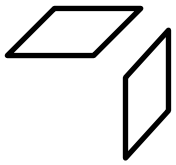
$$F = -\frac{\hbar^2}{2m}\frac{\partial^3}{\partial x^3}\Psi(x,t) + V(x)\Psi(x,t)\, V(i)$$




$$i\hbar\frac{\partial^2}{\partial x^2}\Psi(x,t) = \frac{\hbar^3}{2m}\frac{\partial^3}{\partial x^3}\Psi(x,t) + V(x)\Psi(x,t)\boxed{V(i)}$$



Expanding universe



Cubic dimension

**New Schrodinger, Chan Laoer's Dog Equation (Chan Second Dog Equation)**

$$i\hbar\frac{\partial}{\partial t}\Psi(x,t)\boxed{\frac{\partial}{\partial t}(i)} = \frac{\hbar^3}{2m}\frac{\partial^3}{\partial x^3}\Psi(x,t) + V(x)\Psi(x,t)\boxed{V(i)}$$

We let and add one variables in both sides, one is in the left side $\frac{\partial}{\partial t}(i)$ and one is in the right side $V(i)$.

If we apply the F = MA concept into the condition of an accelerating universe. In that case, we can infer that the state of the cubic box M = $\hbar$ cubed, with the partial derivative cubed over the denominator, partial x cubed, and the function with respect to (x, t), as well as A = V(X)*V(i), will be as relevant as the force involved in the acceleration process. Additionally, suppose we substitute F = MA concept to the scenario of an accelerating universe, we can deduce that the state represented by the cubic box M = $\hbar^3$, with the third partial derivative with respect to x, and the wave function ψ (x, t), as well as A = V(X)*V(i), will be just as significant as the force driving the acceleration.

It means these accelerations may change the properties of particles and matter into force when they accelerate.

**Chan Laoer's Dog Principle (陳老 2 的狗定理)**

**Real (r)** **Virtual (i)**

So, we can develop a model that could align with the Classical Newtonian Theory approach to the quantum physics approach, when it is in the accelerating condition, with respect to space and time. As we all know, since the universe is accelerating, consider putting a dog into a box (a cubic box) on Earth, and another virtual dog outside the world, in space. Over time, the dog in space will experience acceleration related to the expansion pulse, so the other dog will also accelerate. This twin dog paradox describes a situation where one dog stays still or walks inside the box (our Earth), while the other dog drifts in space, where the universe is expanding and accelerating. It's like one dog is in a fixed box, and the other, floating outside Earth, is in a non-fixed, accelerating, expanding box. Suppose one is the real form (r), and the other is a virtual form (dog) (i). The virtual one will follow the universe's acceleration; regarding time, this situation suggests that both can coexist, may perish together, or exist in a cycle of life and death under certain conditions. This new (reinvented) model could explain different states of the dog, linking to zero and one, dual particle quantum conditions. When these two states, zero and one, collide, it may trigger a severe level of evolution. That means the zero and one conditions may coexist at a certain level of state, level, position, and condition. For example, in the same box a-box-in-the-box situation, one box is fixed (BOX EARTH), and the other is not fixed (BOX EXPANDING). Both boxes exist within the same larger universe box (BOX UNIVERSE). This suggests that, at a certain level of quantity, position and condition, these two states, zero (virtual dog) and one (real dog) can coexist. Since both dog is inside the, box-in-the-box, within the same universe box. But when in the other condition, one is virtual and the other is non-virtual, this elimination results in one state being real and the other in a virtual form. These are in two separate boxes-one inside Earth and one outside, representing an inside-out and outside-in condition. Which may bring the switch mode effect, that is one changing to virtual to real, and the other being real into virtual state.

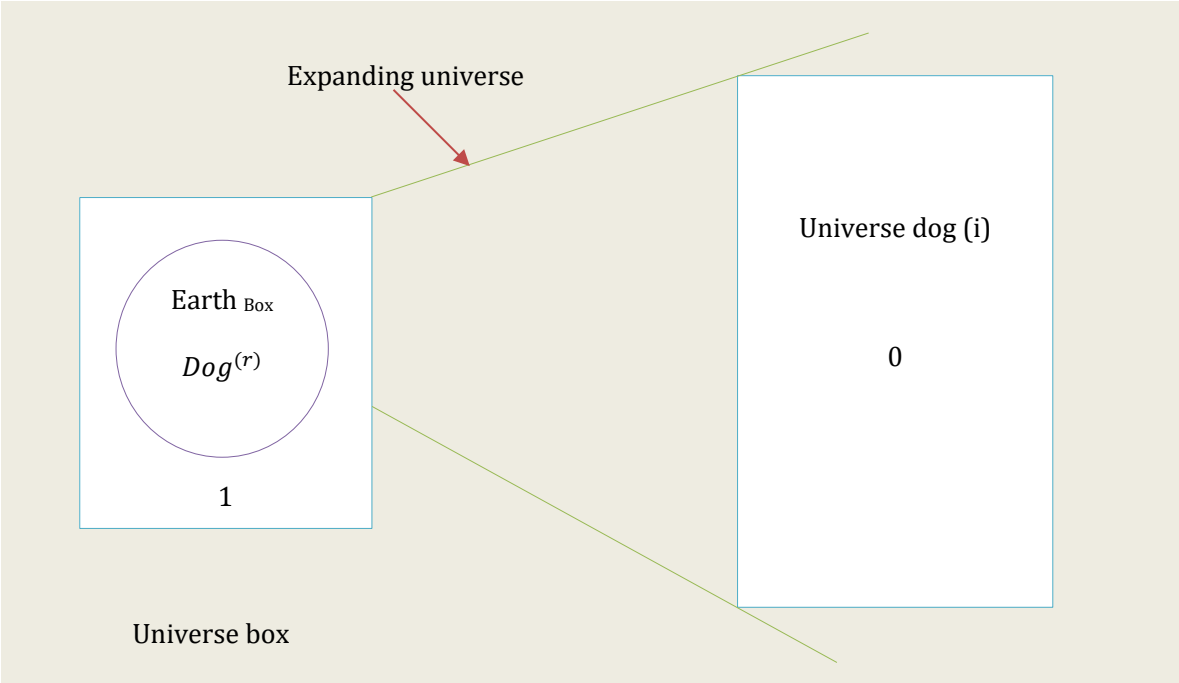



**Figure 1.** "Chen Lao 2's dog" thought experiment (model framework) (Author's view).

These conditions can be explained as either both states occurring in one state, or they can be haphazard. The main reason is that the dogs are both in the same universe. Therefore, we can imagine that they can co-exist in one random state within our universe. That is, both exist at the same time and in the same space node (universe).

This new theoretical model may pave the way to bridge classical Newtonian law and quantum theory, offering enhanced explanation and predictive capabilities. Additionally, this revised model can connect the idea of relativity, since our postulate is based on time and space alongside the quantum mechanical assumption.

**Conclusion**

This novel theoretical framework (Chan Laoer's Dog Principle Assumption) synthesizes Newtonian mechanics with quantum theory, offering enhanced explanatory power and predictive accuracy. It establishes a cohesive connection with relativistic principles by integrating spacetime continuum concepts

rooted in both special and general relativity, while incorporating quantum mechanical postulates such as superposition, entanglement, and wave-particle duality, thereby advancing the unification of classical and quantum physics. We hope this research paper will contribute valuable insights to the field of physics and benefit humanity.

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