

A Philosophical reconciliation between Quantum Mechanics and General Relativity

Tariq Khan
Omaha, NE USA

A short philosophical essay suggesting that quantum mechanics and general relativity may not be able to be unified akin to the limitations of knowledge inherent in the Heisenberg uncertainty principle. Reality may inherently involve only A or B perspectives or inverses as opposed to unified descriptions. Limitations in, or the structure of, human brains may also prevent us from being able to unify quantum mechanics and general relativity if it is even possible.

*"Without mathematics we cannot penetrate deeply into philosophy.
Without philosophy we cannot penetrate deeply into mathematics.
Without both we cannot penetrate deeply into anything."
-- Gottfried Wilhelm Leibniz¹*

Modern physicists have spent nearly a century attempting to unify their two major theories of the 20th Century, general relativity and quantum mechanics, only to run into intractable infinities in their equations. As physicist John Cramer notes:

"There is also another major problem with quantum field theory. The quantum vacuum, according to QFT [quantum field theory], is filled with a fireworks of variable-mass virtual particles that spring briefly into existence, interact to move energy, momentum, angular momentum, and quantum numbers around, and then disappear. As a side effect, these virtual processes give intrinsic energy to the quantum vacuum, and that has consequences. It has now been shown that QFT overestimates the energy present in the vacuum of the universe, as represented by Einstein's cosmological constant L , by a factor of about 10^{120} . That's an enormous number: a one followed by one hundred and twenty zeroes. ... In fact, this QFT calculation holds the record as the worst theoretical prediction in the history of physics."²

But perhaps an answer already exists. When German scientist Werner Heisenberg discovered his *uncertainty principle* it revealed a critical aspect of our reality that a world involving wave properties cannot be defined with certainty. In the uncertainty principle one can know a particle's position or its momentum, but not both at the same time.³ Quantum mechanics is not commutative i.e., order matters.

But can this framework be applied at a larger level? Might it be the case that a mind, or a human mind, (consider how we exist with limited moments or "nows" in time) may not be able to "hold," simultaneously, a framework of quantum mechanics or general relativity. Regardless of what we scribble on our notepad or chalkboard we are still approaching the problem, or potential solution, starting with one theory or another as a starting point. Thus, is it possible that the uncertainty principle scales to larger questions? In short, might it be impossible to unify quantum mechanics and general relativity? We typically consider the uncertainty principle involving a particle's momentum or location in an "instant" of time but, perhaps, the principle also applies to situations larger than instants of time and, like the non-commutative nature of quantum mechanics, involves entire problem-solving approaches lasting human-scale seconds, or minutes, or days.

In quantum mechanics, *the measurement problem* exists as we do not understand how an observation from a conscious mind *decoheres* a probabilistic wave function into a single particle, location, solution, or reality.⁴ Let us consider this "action" as a primordial cut or binary break i.e., between undetermined and determined realities. Here we begin to see additional dualities similar to those found in Heisenberg's uncertainty principle. But how is this inherent schism between realities different than the uncertainty principle's splits e.g., between either momentum or position? Note with the decoherence example there is no third option or "middle ground." Scientists conduct experiments with superpositions and quantum computers, but these are manipulations of unobserved quantum entities.

But this claim implies that we exist in a world that simultaneously exists following both the “laws” of quantum mechanics and general relativity at the same time! Experts would scoff at this claim noting that *quantum gravity* obviously exists at, or inside, a black hole where these two theories intersect ⁵

But recent research has shown very interesting attributes of black holes including their possible ability to collapse wave functions, as if they could even be conscious or *primordial consciousness*. ⁶

We thus seem unable to go beyond a metaphysics, akin to the Chinese Yin and Yang, with a reality, no matter how hard we may try, always composed of a minimum of two alternatives e.g., binary YES vs NO, 0 vs 1, something vs nothing, position vs momentum, quantum mechanics vs general relativity, dead vs alive, conscious vs unconscious, etc. Many theorists interpret reality as based fundamentally on relationships, but perhaps it is based on these YES vs NO “boundaries” or decisions?

Perhaps consciousness itself is a mind turning waves aspects of reality via Fourier transforms into Fractal information. ⁷ Again we see a transformation from A to B. Note too how we have a transformation from B to A as well i.e., an *inverse* relationship and process. Note the prevalence in our reality of inverses including *the fundamental theory of calculus* with its integrals (areas) and derivatives (rates of change). Thus, is the philosophical answer or reconciliation between quantum mechanics and general relativity that they simply are inverses, or cannot be unified, much like in the uncertainty principle where we can have location and position but not both at the same time?

Another approach is that quantum mechanics and general relativity are difficult, if not impossible, to unify as they are both aspects or “shadows” of an underlying reality. As noted by USC physicist Itzhak Bars in a 2026 interview in *New Scientist*:

“By treating position and momentum as merely alternative ways of describing the same underlying reality, Bars predicted that reality could, have extra dimensions, including a second dimension of time. One way to picture this strange second time is to imagine shining a light on a cylinder. From one angle, its shadow is a circle, yet from another, it is a rectangle. They may look completely different - the same way momentum and position do - yet both can come from the same object. “Think of four space and two time dimensions as a room, and our three space and one time [dimensions] as its walls. On each wall, you see a different shadow of the same reality.”⁸

A final possibility is that the construction of architecture of the human brain or mind prevents humans from being able to unify quantum mechanics and general relativity. Much as music helps create *pathways of change* and tree structures of patterns or shapes in a brain, perhaps the “mechanics” of thought and memory in our brains also involves A or B structures, decisions, frameworks, etc. that prevent a full comprehension of simultaneous “dual” states. This limitation may help us from an evolutionary survival perspective, but may limit us from finding, experiencing, or knowing, the “truth” of reality. ⁹

¹ Goethe, N. B., Beeley, P., & Rabouin, D. (2015). *G.W. Leibniz, interrelations between mathematics and philosophy*. Springer.

² Cramer, John G. (2020, January-February). Alternate View Column AV-204. *Analog Science Fiction & Fact Magazine*. Retrieved September 9, 2026, from: <https://www.npl.washington.edu/av/altvw204.html>

³ W. Heisenberg. (2019). *Nuclear physics*. Open Road Media.

⁴ Leggett, A. J. (2005-02-11). "The Quantum Measurement Problem". *Science*. 307 (5711): 871–872. doi:10.1126/science.1109541. ISSN 0036-8075. PM ID 15705838.

⁵ Cox, B., & Forshaw, J. (2024). *Black holes*. Mariner Books.

⁶ Chiou, L. (2025, February 24). New Maps of the Bizarre, Chaotic Space-Time Inside Black Holes. *Quanta Magazine*. Retrieved March 21, 2026 from: <https://www.quantamagazine.org/new-maps-of-the-bizarre-chaotic-space-time-inside-black-holes-20250224/>

⁷ Wegsman, Shalma (2026, August 12). Graduate Student Proves a Quantum Uncertainty Principle for Fractals. *Quanta Magazine*. Retrieved August 15, 2026, from:
<https://www.quantamagazine.org/graduatestudent-proves-the-fractal-uncertainty-principle-20260812/>

⁸ Frankel, Miriam. (2026, September 14). We've long thought that time has only one dimension. What if we're wrong? *New Scientist*. Retrieved September 26, 2026, from:
<https://www.newscientist.com/article/2587285-weve-long-thought-that-time-has-only-one-dimension-what-if-were-wrong/>

⁹ Wolchover, Natalie. "The Evolutionary Argument Against Reality." *Quanta Magazine*, April 21, 2016 [Interview with Donald Hoffman]. Retrieved September 26, 2026, from:
<https://www.quantamagazine.org/the-evolutionary-argument-against-reality-20160421/>