Spacetime is a Quantum-Mechanical Wave Phenomenon

Terry Bollinger
2022-12-20.13:38 EST Tue
Email Excerpt

Date: Tue, 20 Dec 2022

Ron,
…

Hey, speaking of curious twists: Want to know the actual resolution to how an electron goes through two slits at once?

It's in that Tegmark interview comment I made when I said it's the no-added-energy *angle* addressed by the superposition math, not the pencil. In other words, superposition math handles not objects *per se* but their relative positional relationships.

The same applies to electron math: It's not the *electron* going through the slits. It's its positional relationship with the great of the universe. The electron is fine and happy the whole time, thank you, just a bit fuzzy on what's happening around it due to a lack of information. Instead, the positions of the electron interfere. It's the same maths with a different assignment of how it applies to the specifics of the physical universe.

At first glance, that sounds like pilot wave theory, in which a wave interferes and then "guides" the electron through one of the other holes. The difference is that the electron *never traverses the holes at all*. It simply waits in its own space until the universe decides to reconnect with it and tell the electron where *the universe* thinks the electron is located.

The result looks more akin to what most folks would call teleportation, a point I've written about before. The electron starts at a known location but then goes silent for a while, not bothering to interact with the outside universe. However, the universe has its own location image of where the electron is. That image has finite resolution and, intriguingly, *wave dynamics*. Because it is a wave, the universe cannot hold the electron there forever and eventually assigns the electron a new location. Thus, in contrast to classical travel, in which the path of motion is known and irreversibly recorded, the information available in quantum situations is insufficient to define a travel path between the locations. The granularity of *space itself* needs more precision to say where the electron is during that interim period.

This is one of those odd consequences of finite-resolution spacetime, that is, spacetime that has no separate existence (how can it? there's nothing to test!) but instead is created *entirely* by matter and energy. Space and time both become nothing more than a massive network of relationships between mass and energy types and locations. The flip side is that if this network of matter and energy becomes too sparse — e.g., "the quantum domain" and "the deep space between galaxy clusters" — then space and time begin to lose resolution.

That's what the quantum realm *is*: Our classical concept of space and time unraveling at their edges due to insufficient support from locally available mass-energy. The effect is closely akin to how laser beams that are too narrow start spreading out due to a lack of sufficient self-reinforcement.

Thus, delightfully, Schrödinger waves are not *matter* waves, as de Broglie thought. Small bits of matter maintain their internal persistence and minute local spacetime, independently of any outside world. Spin does that.

Schrödinger waves are spacetime *itself* fraying the edges. Spacetime is a quantum-mechanical wave phenomenon.

Cheers,
Terry

Terry Bollinger
2022-12-20.13.38 EST Tue
PDF: https://sarxiv.org/apa.2022-12-20.1338.pdf