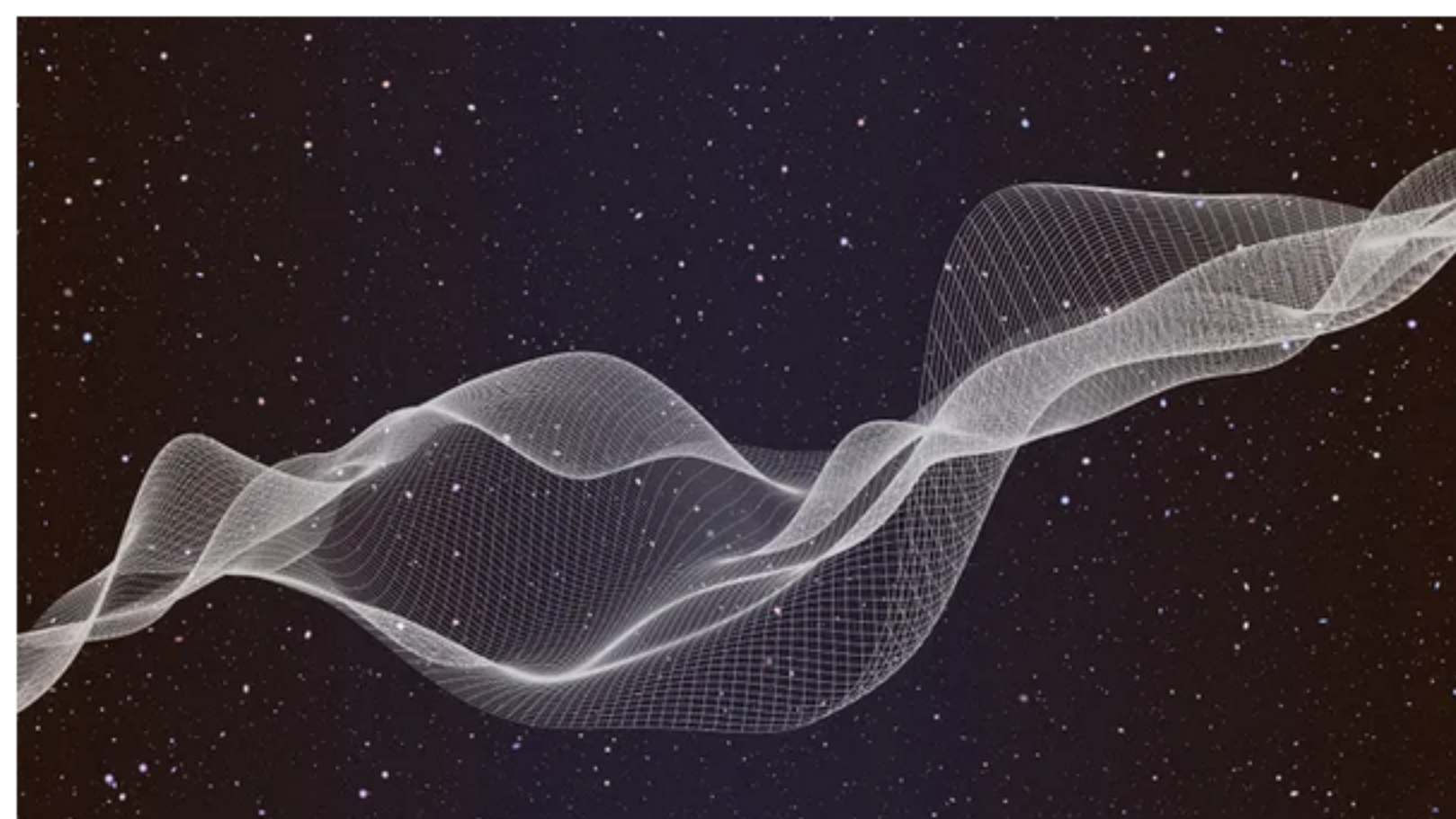


Tweak to Schrödinger's cat equation could unite Einstein's relativity and quantum mechanics, study hints

News By [Andrey Feldman](#) published April 26, 2024

Physicists have proposed modifications to the infamous Schrödinger's cat paradox that could help explain why quantum particles can exist in more than one state simultaneously, while large objects (like the universe) seemingly cannot.



The universe's largest structures appear to follow the rules of Einstein's relativity, while the smallest objects obey quantum mechanics. Can proposed changes to the infamous Schrödinger's cat equations help unite the two theories? (Image credit: TheDigitalArtist / Pixabay)

Theoretical physicists have proposed a new solution to the [Schrödinger's cat paradox](#), which may allow the theories of quantum mechanics and Einstein's relativity to live in better harmony.

The bizarre laws of [quantum physics](#) postulate that physical objects can exist in a combination of multiple states, like being in two places at once or possessing various velocities simultaneously. According to this theory, a system remains in such a "superposition" until it interacts with a measuring device, only acquiring definite values as a result of the measurement. Such an abrupt change in the state of the system is called a collapse.

Physicist Erwin Schrödinger summarized this theory in 1935 with his famous feline paradox — using the metaphor of a cat in a sealed box being simultaneously dead and alive until the box is opened, thus collapsing the cat's state and revealing its fate.

However, applying these rules to real-world scenarios faces challenges — and that's where the true paradox arises. While quantum laws hold true for the realm of [elementary particles](#), larger objects behave in accordance with classical physics as predicted by Einstein's [theory of general relativity](#), and are never observed in a superposition of states. Describing the entire universe using quantum principles poses even greater hurdles, as the cosmos appears entirely classical and lacks any external observer to serve as a measuring device for its state.

"The question is can the Universe, which does not have a surrounding environment, be in such a superposition?" lead author [Matteo Carlesso](#), a theoretical physicist at the University of Trieste in Italy, told Live Science in an email. "Observations say no: everything goes along the classical predictions of General Relativity. Then, what is breaking such a superposition?"

Related: [Quantum 'yin-yang' shows two photons being entangled in real-time](#)

To tackle this question, Carlesso and his colleagues proposed modifications to the Schrödinger equation, which governs how all states, including those in superposition, evolve over time.

