The Unobserved World

A surprising parallel between quantum physics and a child's mind.

In the Quantum Realm, Reality Waits for an Observer

Wave Function Collapse is a core principle of quantum mechanics. It describes how a quantum system goes from a state of ‘many possibilities’ (called a superposition) to a single ‘definite reality’ the moment it is measured or observed.

Concept: **Wave Function Collapse (Physics)**

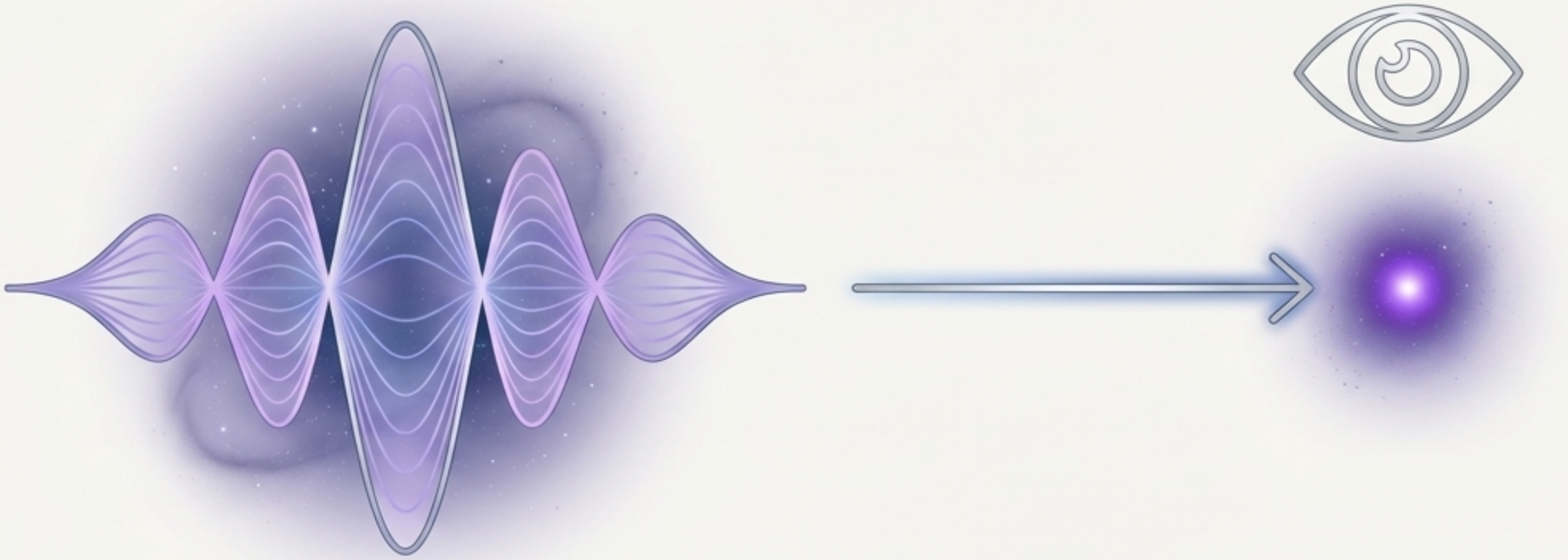
Subject: Subatomic particles (electrons, photons)

The Rule: **Reality is indeterminate until observed.**

From a Wave of Probability to a Single Point

Before Measurement

After Measurement



Superposition: The particle exists in all possible states at once.

Collapse: The particle now has one definite location.

The act of looking doesn't just reveal the particle's location; it forces it to have one.

In a Child's World, Reality Can Simply Vanish

Object Permanence is a fundamental milestone in developmental psychology. It is the understanding that objects continue to exist even when they cannot be seen, heard, or otherwise sensed. Before developing this, an infant behaves as if a hidden object has ceased to exist entirely.

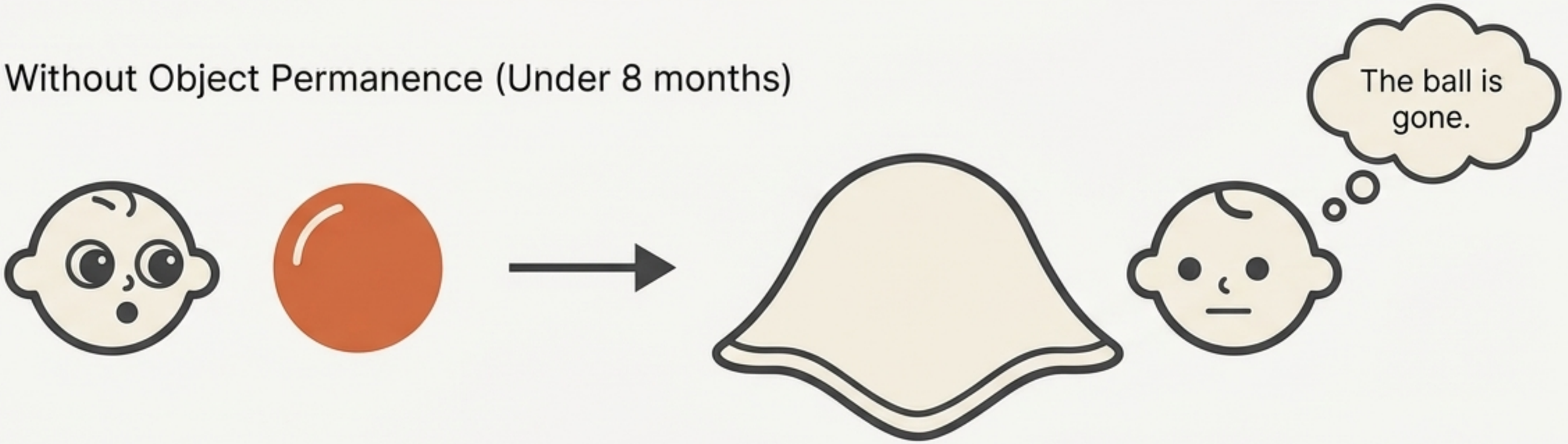
Concept: Object Permanence (Psychology)

Subject: Macroscopic objects (toys, people)

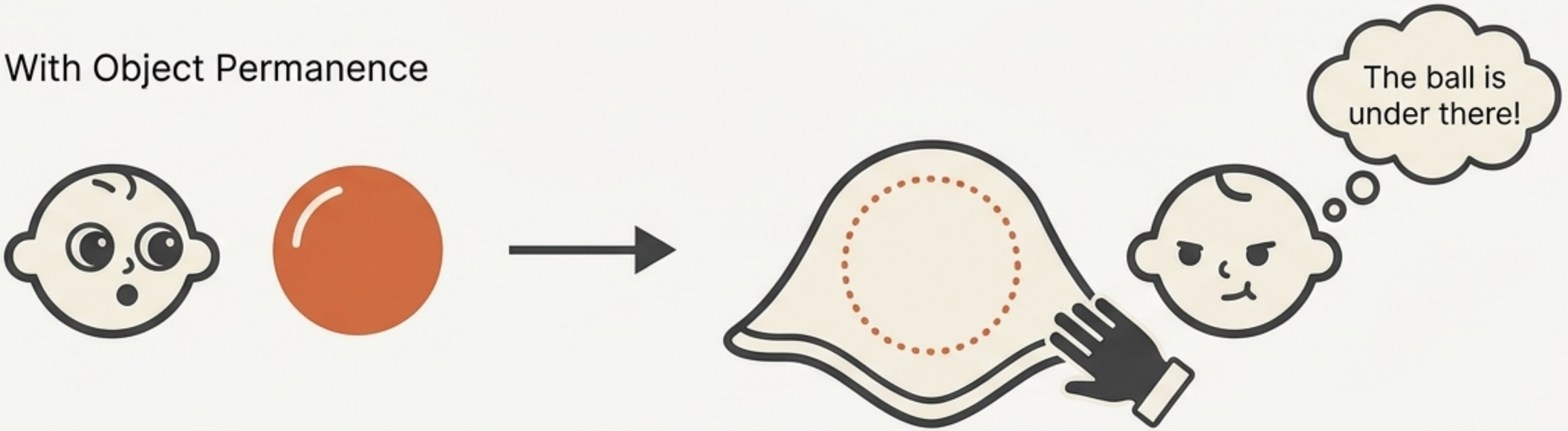
The Rule: Reality is constant regardless of observation.

The Peek-a-Boo Universe

Without Object Permanence (Under 8 months)



With Object Permanence



Two Worlds, Two Opposite Rules of Reality

The Quantum Rule

If you aren’t looking, it isn’t ‘anywhere’ specifically.

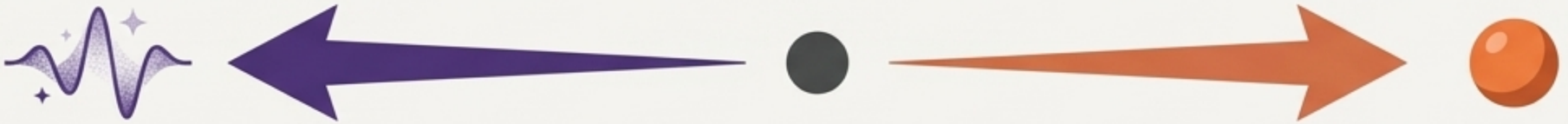
The Classical Rule

Even if you aren’t looking, it is definitely ‘somewhere’.

And yet, both worlds are an answer to
the same fundamental question:

Does a thing exist in a specific state when I am not looking at it?

A “Mirror Image” Connection



Wave Function Collapse and Object Permanence are conceptually fascinating because they are mirror images. They both grapple with the relationship between observation and reality, but arrive at diametrically opposed conclusions for their respective domains.

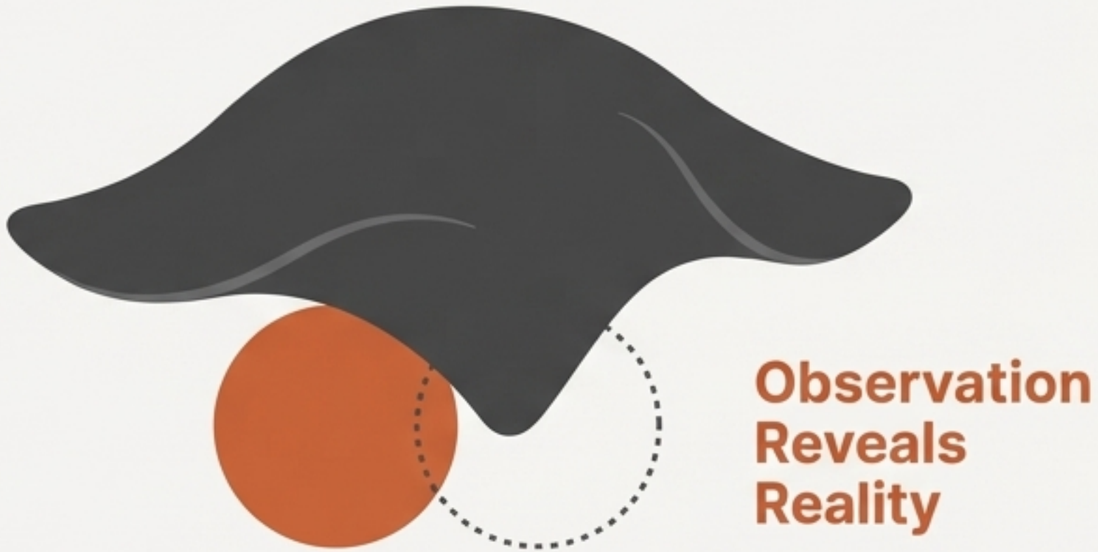
The Quantum Answer: No. Reality is Probabilistic.

In the quantum world, the unobserved object does not have a definite state. Before measurement, an electron isn't simply in an "unknown" location; it exists as a field of potential locations. Observation is not passive discovery; it is an active event that creates a specific outcome.

Observation Creates Reality

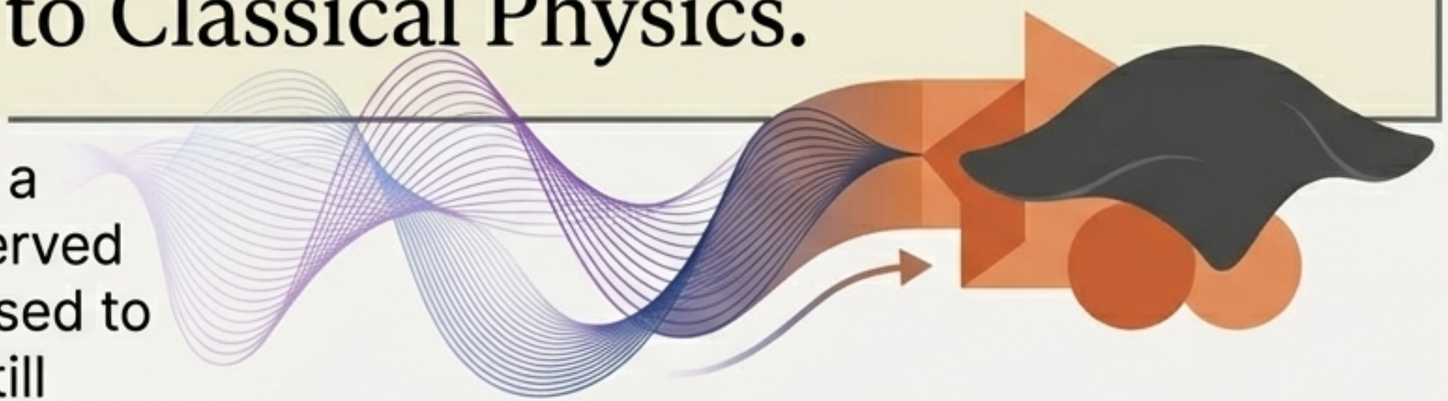
The Classical Answer: *Yes*. Reality is Persistent.

In our macroscopic world, the developing mind learns that reality is stable and objective. Objects have definite properties and locations, whether we are interacting with them or not. This learned understanding is the foundation of classical physics.



To Grow Up is to Reject the Quantum Worldview

Acquiring object permanence is, in a sense, a child's graduation to Classical Physics.



Before a child develops object permanence, their mind works like a **quantum** system. What is not observed has, for all practical purposes, ceased to exist. When they learn the ball is still under the blanket, they are embracing a new set of rules—the rules of a universe that doesn't care if it's being watched.

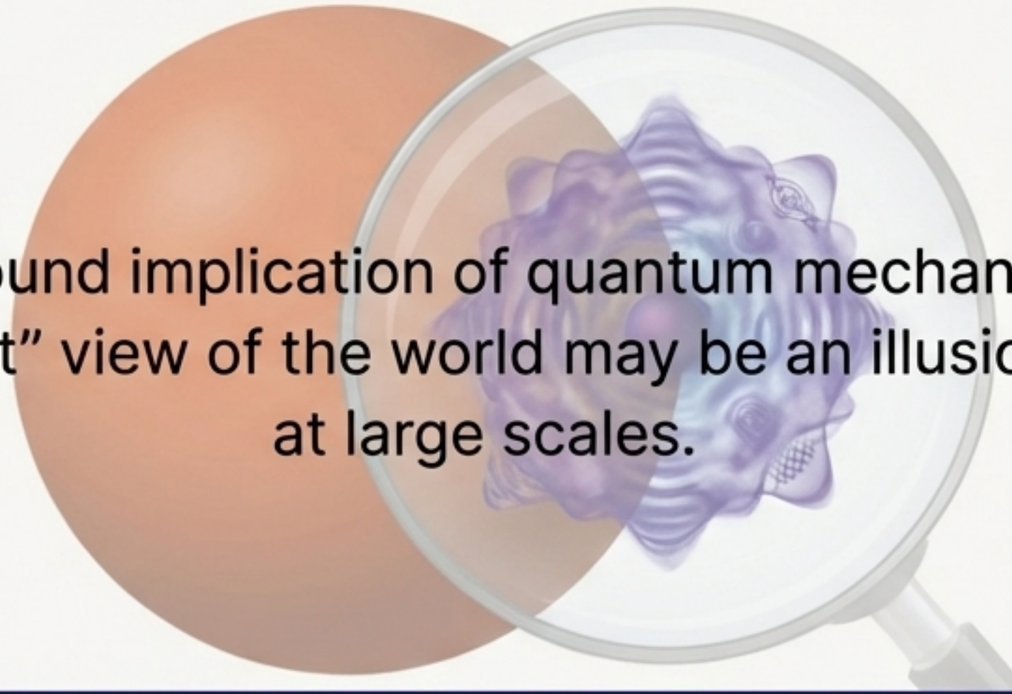
The Crucial Role of the ‘Observer’

The philosophical link is strongest in the Copenhagen Interpretation of quantum mechanics, which posits that a “conscious observer” causes the wave function to collapse. If true, reality itself depends on a mind to perceive it.

Object Permanence:
is a *mental map* that tells you the world is stable.

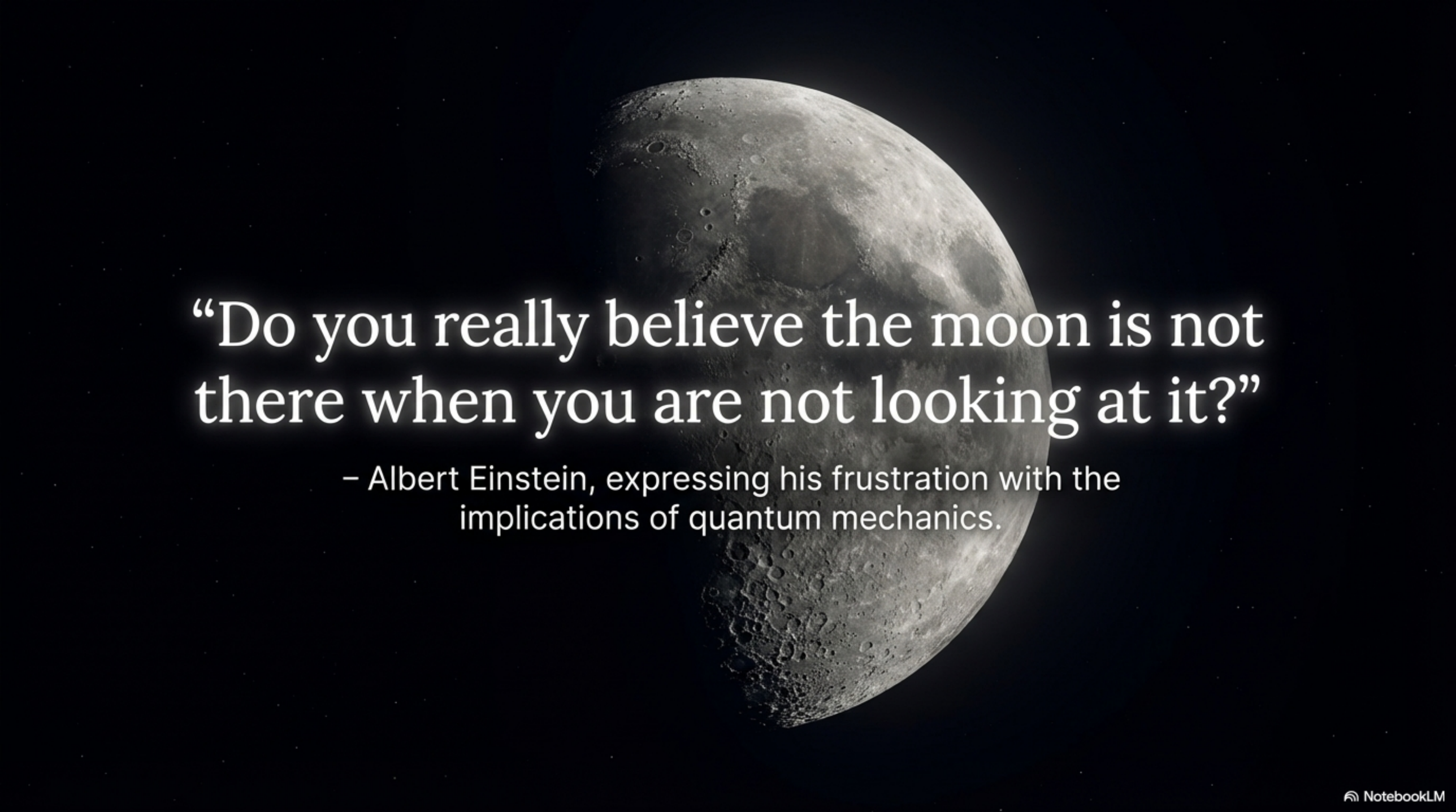
Wave Function Collapse:
is a *physical event* suggesting the world is not stable until we interact with it.

The Spooky Reversal



The most profound implication of quantum mechanics is that our adult, “permanent” view of the world may be an illusion that emerges at large scales.

The universe, at its most fundamental level, behaves more like the world of an infant than that of an adult. The rules we learn to trust every day are not the ultimate rules of reality.


“Do you really believe the moon is not there when you are not looking at it?”
– Albert Einstein, expressing his frustration with the implications of quantum mechanics.