

## Schrödinger Simplified

*If you happen to find yourself in a conversation about quantum theory, chances are that Schrödinger's cat will pop up...which is ironic because its original intention was to illustrate just how absurd quantum theory is.*

In 1935 Erwin Schrödinger and fellow Austrian physicist Albert Einstein were discussing *quantum superposition*, the theory that one subatomic particle can exist in two places at the same time (see page 172 for more). That's when Schrödinger came up with his famous “thought experiment.” It goes like this: if you seal a cat inside a box along with one vial of hydrocyanic acid, there is a 50-50 chance that an atom will decay. If it does, the acid will release a radioactive substance that will kill the cat.\*

Quantum theory says that, because there is no way to know if the cat is alive or dead inside the sealed box, then it is both alive *and* dead—existing in two states at the same time. But the only way to know the true state of the cat is to open the box. This is called the *observer's paradox*: “The observation or measurement itself affects an outcome, so that the outcome as such does not exist unless the measurement is made.” Schrödinger was trying to point out that scientists can say all they want that one particle can

## STRANGE SCIENCE

exist in two places at once, but as soon as you observe it, it's only ever one particle.

However, by the 1950s, the quantum superposition theory had gained such traction in the scientific world that Schrödinger himself wanted to “disown the cat.” But his friend Einstein wrote him a letter of reassurance:

You are the only contemporary physicist...who sees that one cannot get around the assumption of reality—if only one is honest. Most of them simply do not see what sort of risky game they are playing with reality—reality as something independent of what is experimentally established...Nobody really doubts that the presence or absence of the cat is something independent of the act of observation.

*\* No cats were harmed in the writing of this article.*

