

## Quantum entanglement

Well, if you ever decide you want to learn more about quantum physics and God, you can go down a million rabbit holes online. You will most likely get a headache. You might get confused and confounded.

But you might also be fascinated and drawn in to an incredible world...and there you may well get a glimpse of God at work.

That's been my experience. The quantum world is a rich place to imagine how God relates to the world.

The problem now is how to convey anything that will capture even a fragment of that without boring you all to death. I will try.

We tend to think of the world as being sort of like a machine – if I push this button, this coffee pot will start making coffee...if kids play crack the whip on the playground and the end person lets go, they'll go flying. If I throw a ball in the air it will come back down. It's kind of a predictable way to view the world, and in everyday life it works. But when you start looking at teensy weensy particles, things change. Then you enter the quantum world.

The quantum world is different – it's based more on probabilities and possibilities and is not completely predictable. And in the quantum world, two things that can't both be true...are. For example, light is both wave and particle.

This led to a guy named Schrödinger trying to point out how absurd quantum theory had to be. He said, why if quantum theory is true, it means that if you put a cat in a sealed box and rig it up so that its life depends on a quantum event happening or not happening, at some point the cat is both alive and dead at the same time. Ridiculous Schrodinger said. No way can something be both alive and dead.

Except as more scientists and mathematicians have worked out the equations, the more it looks like it is actually true. See what I mean about getting a headache?

Schrodinger's cat is a paradox. A paradox is when two things that can't both be true...are.

And faith is full of paradoxes. Jesus was fully human and fully God, not 50-50. And we are at the same time fully saint...AND sinner...not 50-50. Jesus is here within us, but also outside of us.

Is it possible that the life of faith is at perfectly at home in the quantum world?

This is probably an oversimplification, but in the quantum world, everything affects everything else in a way that's not totally predictable like it would be in our machine world. Even the act of observing something changes it.

When people who are both scientists and theologians look at all this, they find in the quantum world space for God to work, an understanding of what prayer might actually be doing, and maybe even a hint of trying to explain the Trinity. The science of a machine like universe really doesn't allow any of that. In fact in a machine like world, the only thing God really could have done is set the whole thing in motion and let it go.

The other thing about the quantum world is that it is a very interconnected one.

That brings us to this idea of entanglement. If you take two tiny particles – like electrons – they will each have a certain spin. Say one spins up and one spins down. If they interact, they become entangled – their behavior is forever linked. If one's spin changes direction, the other will instantly change too. They act as a unit.

But the crazy thing is that this happens even if they are separated by a long way...they are forever linked. They could be miles apart and if one spins up the other down. And if the one spinning up changes to down the other will instantly begin spinning up.

The picture on the front of the bulletin is supposed to be the first photo of this quantum entanglement.

Scientists believe this quantum entanglement is woven into the very deepest reality in the natural world.

To put it in God terms, God created the universe as one big web of interconnection. People whose work takes them deep into the intersection of faith and science dare to speak of this connectedness and interdependence as love...that this entanglement...this love...is at the very heart of reality.

But then that shouldn't be too surprising. The very existence of God as a trinity...is an existence whose very definition is a loving relationship. God is love. God created out of love. It seems actually fairly logical that at the heart of the natural world is this entanglement...that we could call love.

The passage in John's gospel seems to get at this...in Christ God is making us one with God, but also one with each other.

If entanglement happens between the tiny particles that make us up, then we must be entangled all over the place with everything and everyone in creation.

As entanglement involves ever larger objects and spaces, we enter the realm of chaos theory. Chaos theory says that a seemingly insignificant event in one place can have a dramatic impact far away.

You may have heard of the butterfly effect...when a butterfly flaps its wings in Brazil, it affects the weather in Texas. The point is that all of creation is somehow connected. God created us to be connected to each other and to the rest of creation.

Maybe this interconnectedness is what the Holy Spirit is...or does.

One of the articles I read had a link to another article titled Anyone Can Become a Troll. It's sort of an image of entanglement at the level of human interaction. So we'll leave the tiny particle world behind.

First, let's define troll – in this sense, a troll is not a little creature lurking under a bridge. A troll is someone lurking on the internet, and writing comments on posts and articles that are inflammatory, outrageous and clearly designed to make people angry and start an argument.

The article described an experiment with two groups of people looking at the CNN website and making comments.

In one group, the first comment was a troll comment. In the other group, the first comment was positive...kinder.

It turns out that even people who have never been trolls are much more likely to start writing troll-like comments if the thread starts out that way.

The thread that started with positive, kinder comments was more likely to stay that way. How people responded was dependent on what the very first person said...the first comment set the tone.

It's actually a pretty good example of how our behavior in this interconnected and interdependent world can affect other people.

Just imagine how this can work in the world...God weaves love into the very tiniest recesses of creation. We live in this world that is literally made by love.

Our very lives and well-being are connected to and dependent on the lives and well-being of not only other humans, but all of creation. That means the tiniest thing we do can have a huge and multiplying effect. One little kindness can grow and spread and become a huge act of love.

And of course the opposite can happen too.

That means that No kindness...no act of love we show...no political action we take...nothing is too small to be significant. Prayer may even act at this interconnected and interdependent level of being.

God poured love into creation in such vast quantities that we can let it overflow. We can show love in the smallest of ways, and trust that in this love soaked creation, God will multiply it.

I realize I could probably have just told the troll story and skipped over all the quantum physics to get to my point.

But I want to talk about the science because, first of all, I find the intersection of faith and quantum physics and relativity and all that fascinating, so in a small way, I'm bring you along on my journey.

But we also live in a world where too many have decided that they have to deny science to maintain faith, or give up their faith if science is correct.

At a very minimum, I want us to be different than that...I want us to marvel at the things scientists learn about the universe...and even be able to see the handprints of God all over it.

But if you take nothing of the science from this series, here are the things I hope you do:

Faith means trusting that God is actually to be found in the amazing things we are discovering about the universe.

We can hope because we trust that Christ is woven into an evolving creation and that he is intimately connected to everything that happens to us and the world.

And we can come to see that from the level of subatomic particles all the way up to our entire planet and its creatures, and on up to the stars and galaxies, the whole thing is created and held together by love.