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Quasars and Free Will. Does Free Will Exist?

Free will

By Brett Schock

The promised follow up to my blog about the quasar. Free will – it's a "loophole" right now in the quantum physics world and some scientists at MIT have figured out a way that they might be able to test it. I'll try to summarize the background a bit, then paraphrase the experiment, explain what it has to do with quasars, and then you can read the article yourself. It's going to be quite the find if they really do pull it off.

Non-locality is a quantum property, that is, a property of the smallest things that, as of our level of knowledge about the universe right now, can exist. In this quantum world, everything is fuzzy. There is no "reality" to things. There are clouds of possibilities and only when you measure something does it fall into "being". That's hard to wrap your head around, but give this one a shot: your significant other is a twin. They're in a room full of mirrors facing each other. You enter the room and have to find "your" person. Upon finding them, obviously you now know that the other "real" person in the room is not "yours". But on first glance, you have no idea which one is a real person and which is just a reflection. And, if all you're worried about is that they're there, or conveying a message to them, or even just hearing their voice or seeing their face, it still really doesn't matter which "them" is "real". This is how pretty much everything in the universe "exists" at its smallest levels. And since our day-to-day function of breathing, eating, talking to each other, playing music, observing stars, etc. doesn't really care

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about "which twin is which", our two worlds co-exist without us having to pick out the "right twin". Water holds together as H_2O as long as somewhere in those clouds around the oxygen, there are two "real" electrons that connect to two "real" hydrogens and viola … life.

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So, the property that is being tested is something called spin. It doesn't really relate to say spinning a ball, but it carries the name anyway. A lot of high-level science is like that; the names suck, they make no sense, they're counterintuitive, or worse yet, relics of an era before a major breakthrough (like the classifications of star types … Class III is older than Class I. Figure that one out.). Spin can only be one of two states; +1/2 or -1/2. But, just like the twin, until you measure it, you don't know which it is, but once you measure it, the other particle in the experiment automatically takes on the other property.

This applies even to photon (packet-particles of light) that are separated by physical distances but are "entangled" (I still haven't figured out what "entangled" means, but go with it). And since nothing, and I mean nothing, should be able to go faster than the speed of light, there should be no way that these two photons can "communicate" with each other to tell the other that it was just measured and spit out a reading of "+1/2" (randomly). That is, unless a concept that Einstein came up with called "spooky action at a distance" was coming into play. So now you have non-locality… and seemingly you're violating the speed of light. That is, unless the result has been pre-determined… i.e., **there is no free will**.

So the experiment is this: create entangled photons, don't "tell" them what property you're going to measure, and use properties of quasars to set that property based on a chart of "if quasar does this, measure this". Quick primer if you didn't read my other blog, a quasar is the incredibly bright light generated by a supermassive black hole at the center of the earliest galaxies in the universe. We are talking galaxies that have not been in close proximity to each other for over 13 ⅛ billion years. They should not be able to share information.

Now, if free will is real, then the measured properties should be no different than if you used random change to determine what property to measure. But, if something else is going on, then there will be a greater-than-random match. And that would mean that the quasars were "talking" to each other and "talking" to the photons … all across nearly

14 billion light years of time and space. What. The.

Now, in some sense, a property of relativity related to photons makes this sort of make some kind of logic. Photons carry light and travel at the speed of light. But, according to relativity (which has been experimentally proven; just use your GPS and you'll see that its real), photons never "age". At the speed of light, time is infinite. Which means that photons that are part of the cosmic microwave background, from 380,000 years after the Big Bang; light that is 13.88 billion years old, has not "aged a day". On the other hand, the photons that just left your screen and traveled to the rods in your eye and those that the rods released into your brain which translated that photon into the words your reading also have not "aged a day". So, if photons never age and never experience time, what's to say that they couldn't "communicate" with each other without violating the speed of light? That last part is all conjecture on my part, I've never seen science to that end, but it seems to make some sort of sense among a topic that makes none otherwise.

And on a larger scale than this amazing test, I wonder if free will even necessary? I certainly don't feel that it is, but I'm an atheist science nut who's got oddball against the grain thoughts about almost everything. But really, what defines "free"? It's really just a choice, isn't it? So is it free if you have a choice between two things? Five? Ten? A Hundred? A Million? Infinite? At what point do you even know how many choices you have? What is our brain – the conscious part that can make the decisions, not the animalistic, buried subconscious that makes decisions we don't know we're making – even capable of absorbing? Does it top out at a few dozen choices? Think about things that you really don't have free will over. Breathing even; yes you have a choice to hold your breath, but eventually you'll pass out and then your body will continue to breath, even if you chose not to. So are you really "free"? Or are you just afforded a number of pathways to choose from to accomplish the same end game? Does it really matter? Why do you care?

Here's the original article: http://web.mit.edu/press/2014/closing-the-free-will-loophole-0220.html Credit for all of this goes to a combination of that article, Dr. Ramon Lopez at University of Texas Arlington's awesome Physics 3 course and Morgan Freeman's Through the Wormhole. That and some late night reading of textbooks. Yea, I'm that big a nerd. At least about this stuff.

That should keep enough topics open that I can keep doing this for months … plus there's this cool idea that life is just inevitability as the universe seeks better ways to disperse energy.

Until next time.

Brett

Comments

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