What Is Quantum Collapse?[1]

Quantum waves become physical particles by quantum collapse, but no one knows why:

"*After more than seven decades, no one understands how or even whether the collapse of a probability wave really happens*." (Greene, 2004), p119

Quantum equations describe quantum "particles" in terms of three-dimensional waves that spread out at the speed of light then collapse to a physical state when observed. This makes no physical sense, but if *programs* spreading on a network cause its nodes to overload and reboot, they will restart at a point, in a merge that can re-allocate processing in potentially new ways. In computing, if a *parent* program with *child* instances restarts, *all* its child instances instantly stop, just as quantum theory says happens to quantum states in a collapse. The collapse of the wave function is then just the inevitable disbanding of child instances when a parent program restarts. The quantum states that disappear are not *things* that inherently exist, but *program instantiations* that come and go.

A processing reboot is irreversible, as all previous information states are lost, but no processing is lost, because the program instructions before and after the reboot are the same. This *conservation of processing* could underlie all our laws of conservation.

What *really* arrives at a detector screen is not a lonely photon particle looking for a place to hit, but a cloud of program instances demanding processing from screen nodes already busy with its matter. When they overload and reboot, the *one* that first restarts the *entire* photon program is where the photon "hits" the screen. The first client node to access and restart the photon program hosts the physical event. For example, if two electrons collide we see those leaving as the same ones that entered. Yet they are brand new, just off the quantum press, as what went in was destroyed by the reboot. Quantum entities are continuously annihilated and created but the processing involved is constant. Every physical event is a creation, but the conservation of processing maintains the illusion that particles continuously exist.

The universal screen

To Einstein, quantum collapse was absurd, as it implied faster than light travel. If a photon was a spreading wave, as quantum theory said, before it hit a screen its wave function exists at points A or B with some probability, but after it hits it is entirely at point A say, not at B. The moment A "knows" it is the photon, then B "knows" it isn't, but as the screen moves further away eventually A and B could be in different galaxies. If quantum collapse is *instant* how can nature keep this order? How can an event in one place immediately alter another *anywhere in the universe*?

To Einstein this was illogical but pragmatists like Bohr just wanted to the results. He made theory fit the practice, so today virtual particles from invisible fields appear and disappear as needed to create effects based on arcane formulae fitted with data-derived parameters, which is not right.

In quantum realism, a photon is a program spreading pixels on the screen of our universe as our programs draw images on our screens. Just as our programs needn't "go to" a screen pixel to alter it, so a photon program can alter its quantum states anywhere on the "screen" of our universe. The speed of light as a node-to-node transfer limit doesn't affect the program-node link, so no matter how big a quantum wave becomes, it can always restart at any point instantly.

Greene, B. (2004). *The Fabric of the Cosmos*. New York: Vintage Books.

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[1] This is section 3.3.5 from Chapter 3 The Light of Existence, of the book Quantum Realism by Brian Whitworth, currently under development. The link gives a free early access to the whole chapter.