The Biocentric Universe Theory: Life Creates Time, Space, and the Cosmos Itself

Adapted from Biocentrism: How Life and Consciousness Are the Keys to Understanding the True Nature of the Universe*, by Robert Lanza with Bob Berman, published by BenBella Books in May 2009.*

The farther we peer into space, the more we realize that the nature of the universe cannot be understood fully by inspecting spiral galaxies or watching distant supernovas. It lies deeper. It involves our very selves.

This insight snapped into focus one day while one of us (Lanza) was walking through the woods. Looking up, he saw a huge golden orb web spider tethered to the overhead boughs. There the creature sat on a single thread, reaching out across its web to detect the vibrations of a trapped insect struggling to escape. The spider surveyed its universe, but everything beyond that gossamer pinwheel was incomprehensible. The human observer seemed as far-off to the spider as telescopic objects seem to us. Yet there was something kindred: We humans, too, lie at the heart of a great web of space and time whose threads are connected according to laws that dwell in our minds.

Is the web possible without the spider? Are space and time physical objects that would continue to exist even if living creatures were removed from the scene?

Figuring out the nature of the real world has obsessed scientists and philosophers for millennia. Three hundred years ago, the Irish empiricist George Berkeley contributed a particularly prescient observation: The only thing we can perceive are our perceptions. In other words, consciousness is the matrix upon which the cosmos is apprehended. Color, sound, temperature, and the like exist only as perceptions in our head, not as absolute essences. In the broadest sense, we cannot be sure of an outside universe at all.

For centuries, scientists regarded Berkeley's argument as a philosophical sideshow and continued to build physical models based on the assumption of a separate universe "out there" into which we have each individually arrived. These models presume the existence of one essential reality that prevails with us or without us. Yet since the 1920s, quantum physics experiments have routinely shown the opposite: Results do depend on whether anyone is observing. This is perhaps most vividly illustrated by the famous two-slit experiment. When someone watches a subatomic particle or a bit of light pass through the slits, the particle behaves like a bullet, passing through one hole or the other. But if no one observes the particle, it exhibits the behavior of a wave that can inhabit all possibilities—including somehow passing through both holes at the same time.

Some of the greatest physicists have described these results as so confounding they are impossible to comprehend fully, beyond the reach of metaphor, visualization, and language itself. But there is another interpretation that makes them sensible. Instead of assuming a reality that predates life and even creates it, we propose a biocentric picture of reality. From

this point of view, life—particularly consciousness—creates the universe, and the universe could not exist without us.

Messing with the Light

Quantum mechanics is the physicist's most accurate model for describing the world of the atom. But it also makes some of the most persuasive arguments that conscious perception is integral to the workings of the universe. Quantum theory tells us that an unobserved small object (for instance, an electron or a photon—a particle of light) exists only in a blurry, unpredictable state, with no well-defined location or motion until the moment it is observed. This is Werner Heisenberg's famous uncertainty principle. Physicists describe the phantom, not-yet-manifest condition as a wave function, a mathematical expression used to find the probability that a particle will appear in any given place. When a property of an electron suddenly switches from possibility to reality, some physicists say its wave function has collapsed.

What accomplishes this collapse? Messing with it. Hitting it with a bit of light in order to take its picture. Just looking at it does the job. Experiments suggest that mere knowledge in the experimenter's mind is sufficient to collapse a wave function and convert possibility to reality. When particles are created as a pair—for instance, two electrons in a single atom that move or spin together—physicists call them entangled. Due to their intimate connection, entangled particles share a wave function. When we measure one particle and thus collapse its wave function, the other particle's wave function instantaneously collapses too. If one photon is observed to have a vertical polarization (its waves all moving in one plane), the act of observation causes the other to instantly go from being an indefinite probability wave to an actual photon with the opposite, horizontal polarity—even if the two photons have since moved far from each other.

In 1997 University of Geneva physicist Nicolas Gisin sent two entangled photons zooming along optical fibers until they were seven miles apart. One photon then hit a two-way mirror where it had a choice: either bounce off or go through. Detectors recorded what it randomly did. But whatever action it took, its entangled twin always performed the complementary action. The communication between the two happened at least 10,000 times faster than the speed of light. It seems that quantum news travels instantaneously, limited by no external constraints—not even the speed of light. Since then, other researchers have duplicated and refined Gisin's work. Today no one questions the immediate nature of this connectedness between bits of light or matter, or even entire clusters of atoms.

Before these experiments most physicists believed in an objective, independent universe. They still clung to the assumption that physical states exist in some absolute sense before they are measured.

All of this is now gone for keeps.

Wrestling with Goldilocks

The strangeness of quantum reality is far from the only argument against the old model of reality. There is also the matter of the fine-tuning of the cosmos. Many fundamental traits, forces, and physical constants—like the charge of the electron or the strength of gravity—make it appear as if everything about the physical state of the universe were tailor-made for life. Some researchers call this revelation the Goldilocks principle, because the cosmos is not "too this" or "too that" but rather "just right" for life.

At the moment there are only four explanations for this mystery. The first two give us little to work with from a scientific perspective. One is simply to argue for incredible coincidence. Another is to say, “God did it,” which explains nothing even if it is true.

The third explanation invokes a concept called the anthropic principle, first articulated by Cambridge astrophysicist Brandon Carter in 1973. This principle holds that we must find the right conditions for life in our universe, because if such life did not exist, we would not be here to find those conditions. Some cosmologists have tried to wed the anthropic principle with the recent theories that suggest our universe is just one of a vast multitude of universes, each with its own physical laws. Through sheer numbers, then, it would not be surprising that one of these universes would have the right qualities for life. But so far there is no direct evidence whatsoever for other universes.

The final option is biocentrism, which holds that the universe is created by life and not the other way around. This is an explanation for and extension of the participatory anthropic principle described by the physicist John Wheeler, a disciple of Einstein’s who coined the terms *wormhole* and *black hole*.

Seeking Space and Time

Even the most fundamental elements of physical reality, space and time, strongly support a biocentric basis for the cosmos.

According to biocentrism, time does not exist independently of the life that notices it. The reality of time has long been questioned by an odd alliance of philosophers and physicists. The former argue that the past exists only as ideas in the mind, which themselves are neuroelectrical events occurring strictly in the present moment. Physicists, for their part, note that all of their working models, from Isaac Newton’s laws through quantum mechanics, do not actually describe the nature of time. The real point is that no actual entity of time is needed, nor does it play a role in any of their equations. When they speak of time, they inevitably describe it in terms of change. But change is not the same thing as time.

To measure anything’s position precisely, at any given instant, is to lock in on one static frame of its motion, as in the frame of a film. Conversely, as soon as you observe a movement, you cannot isolate a frame, because motion is the summation of many frames. Sharpness in one parameter induces blurriness in the other. Imagine that you are watching a film of an archery tournament. An archer shoots and the arrow flies. The camera follows the arrow’s trajectory from the archer’s bow toward the target. Suddenly the projector stops on a single frame of a stilled arrow. You stare at the image of an arrow in midflight. The pause in the film enables you to know the position of the arrow with great accuracy, but you have lost all information about its momentum. In that frame it is going nowhere; its path and velocity are no longer known. Such fuzziness brings us back to Heisenberg’s uncertainty principle, which describes how measuring the location of a subatomic particle inherently blurs its momentum and vice versa.

All of this makes perfect sense from a biocentric perspective. Everything we perceive is actively and repeatedly being reconstructed inside our heads in an organized whirl of information. Time in this sense can be defined as the summation of spatial states occurring inside the mind. So what is real? If the next mental image is different from the last, then it is different, period. We can award that change with the word *time*, but that does not mean there is an actual invisible matrix in which changes occur. That is just our own way of making

sense of things. We watch our loved ones age and die and assume that an external entity called time is responsible for the crime.

There is a peculiar intangibility to space, as well. We cannot pick it up and bring it to the laboratory. Like time, space is neither physical nor fundamentally real in our view. Rather, it is a mode of interpretation and understanding. It is part of an animal's mental software that molds sensations into multidimensional objects.

Most of us still think like Newton, regarding space as sort of a vast container that has no walls. But our notion of space is false. Shall we count the ways? 1. Distances between objects mutate depending on conditions like gravity and velocity, as described by Einstein's relativity, so that there is no absolute distance between anything and anything else. 2. Empty space, as described by quantum mechanics, is in fact not empty but full of potential particles and fields. 3. Quantum theory even casts doubt on the notion that distant objects are truly separated, since entangled particles can act in unison even if separated by the width of a galaxy.

Unlocking the Cage

In daily life, space and time are harmless illusions. A problem arises only because, by treating these as fundamental and independent things, science picks a completely wrong starting point for investigations into the nature of reality. Most researchers still believe they can build from one side of nature, the physical, without the other side, the living. By inclination and training these scientists are obsessed with mathematical descriptions of the world. If only, after leaving work, they would look out with equal seriousness over a pond and watch the schools of minnows rise to the surface. The fish, the ducks, and the cormorants, paddling out beyond the pads and the cattails, are all part of the greater answer.

Recent quantum studies help illustrate what a new biocentric science would look like. Just months? ago, Nicolas Gisin announced a new twist on his entanglement experiment; in this case, he thinks the results could be visible to the naked eye. At the University of Vienna, Anton Zeilinger's work with huge molecules called buckyballs pushes quantum reality closer to the macroscopic world. In an exciting extension of this work—proposed by Roger Penrose, the renowned Oxford physicist—not just light but a small mirror that reflects it becomes part of an entangled quantum system, one that is billions of times larger than a buckyball. If the proposed experiment ends up confirming Penrose's idea, it would also confirm that quantum effects apply to human-scale objects.

Biocentrism should unlock the cages in which Western science has unwittingly confined itself. Allowing the observer into the equation should open new approaches to understanding cognition, from unraveling the nature of consciousness to developing thinking machines that experience the world the same way we do. Biocentrism should also provide stronger bases for solving problems associated with quantum physics and the Big Bang. Accepting space and time as forms of animal sense perception (that is, as biological), rather than as external physical objects, offers a new way of understanding everything from the microworld (for instance, the reason for strange results in the two-slit experiment) to the forces, constants, and laws that shape the universe. At a minimum, it should help halt such dead-end efforts as string theory.

Above all, biocentrism offers a more promising way to bring together all of physics, as scientists have been trying to do since Einstein's unsuccessful unified field theories of eight

decades ago. Until we recognize the essential role of biology, our attempts to truly unify the universe will remain a train to nowhere.

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