

Dear Fred,

\*I have heard that not all physics believe that parallel universes really exist. Do you believe in that?

Fred Alan Wolf: Yes, I do. However one should recognize that there are other interpretations of quantum physics that do not postulate parallel universes.

\*Why have you interested in physics and more over in parallel worlds existence? What is your story?

Fred Alan Wolf: My fascination with the world of physics began one afternoon as an 11 year-old child at a local movie matinee, when the newsreel revealed the awesome power and might of the world's first atomic explosion. This fascination continued and led me to study mathematics and physics. In 1963, I received my Ph.D. in theoretical physics from UCLA and began researching the field of high atmospheric particle behavior following a nuclear explosion. Since then I have delved into the relationship between human consciousness, psychology, physiology, the mystical, and the spiritual.

Quantum physics leads to fundamental mystery—the dual nature of subatomic matter and energy, which in turn relies on the ability of two or more possibilities to interfere with each other altering the results of expected observations. These possibilities have a strange mathematical form resembling in many instances, waves moving through space, and in other instances bits of information called *qubits* or quantum bits of information that can move along channels in alternate worlds or universes or possibilities. The mystery remains with us today. No one knows why subatomic matter behaves this way. We do know that the rules of quantum physics work. With its rules we can explain many, many previously unexplainable facts of physical life. Yet, despite its enormous practical successes (quantum theory correctly predicts the behavior of such things as Lasers, microchips, photocells, nuclear reactors, long range deep space communication devices, many types of solid-state inventions, transistors, and materials at very low temperatures, to mention just a few), quantum theory is still today so contrary to intuition, that even after more than one hundred years since its inception, many experts do not agree what to make of it. Today's physics deals with merging quantum physics and the general theory of relativity—something which seems more and more to indicate that parallel universes may be necessary to forge this understanding.

This is why parallel universes came to be considered as a serious way to explain this fundamental mystery. In 1957, Hugh Everett, III, a graduate student at Princeton University studying under the highly regarded physicist, John Archibald Wheeler, came up with the rather strange notion<sup>1</sup> that we should take quantum mechanics seriously. If it says that two alternatives can interfere with each other, then somehow those alternatives must both exist simultaneously. If possibilities could affect each other, if two or more probabilities could somehow "add up," then somehow these possibilities must really exist somewhere. But where?

Apparently, the wave of possibilities was composed of a number of particles—with each particle really existing somehow in a separate world. In this way, having separate or parallel worlds, only one particle would ever be found in any one world.

.\*When the theory of parallel universes was first announced?

Fred Alan Wolf: See previous answer.

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<sup>1</sup> See the exposition of Everett's ideas in: Dewitt Bryce S. and Graham, Neill. "THE MANY-WORLDS INTERPRETATION OF QUANTUM MECHANICS". Princeton, New Jersey: Princeton Univ. Press, 1973.

\*What theories or ideas prove the existence of parallel worlds? Could you explain it in simple words please?

Fred Alan Wolf: Again see previous answer. I should only add again that there are alternate ways to explain the results of quantum physics however they all require adding something extra outside of quantum physics to do that. Parallel universes theory does not do this—the theory of quantum physics already contains the idea within its mathematical formulation.

\*Does someone know how many parallel universes are? Maybe the number is endlessness?

Fred Alan Wolf: As many as there are possibilities. For a spin- $\frac{1}{2}$  particle two parallel universes are enough. For a particle moving through space an infinite number are needed.

\*It is said that parallel universes are related to our world. Is it true and why?

Fred Alan Wolf They are as related to our world as much as any phenomena explained by quantum physics is related to our world. See previous answer to 2<sup>nd</sup> question. Parallel or distorted duplication of what already exists, is indeed an important feature of parallel universes according to the way some physicists view them. Accordingly, there are parallel "you"s and "me"s somehow existing in the same space and time that we live in but normally not seen or sensed by us. In these universes, choices and decisions are being made at the very instant you are choosing and deciding. Only the outcomes are different leading to different but similar worlds.

Legends exist describing "döppelgangers" or people that are perfect duplicates of other people. These "doubles" are sometimes "space-invaders" coming from a distant galaxy. Who has not looked out at the distant stars and wondered if life did exist "out there"? What would that life be like? Could it have developed like our life on earth? Could it in fact be true that on a far distant galaxy, there exists another middle-aged star called Sol and around it whirls nine or ten planets with the third from it appearing as a blue marble when seen from its solitary satellite? Could there be a parallel earth, another planet which is an exact duplicate of ours? Could the forces of the universe create parallel beings like ourselves and could those beings be in communication with us in some manner that we may just be beginning to detect? These questions will continue to be asked.

\*I would like to ask... Are parallel universes similar to our universe? Do there live the same people as we are?

Fred Alan Wolf: They can be or they can be sub-worlds contained within our own depending on how an experiment is being done. See previous answer as well.

\*If human dies in our world could he still live in some of parallel universes?

Fred Alan Wolf: Yes. As long as the event of death could have resulted in life or death such as a car collision, or falling off a ladder, e.g., the person could be alive in universe and dead in the other.

\*I have read that in other universes people race may have become extinct... Do you think it is possible?

Fred Alan Wolf: Yes—anything that can be reconciled with a physics theory can happen including events that lead to survival or extinction of a whole race.

\*Is it possible that some events in one universe would be responsible for the destruction of other universe or universes? If yes, what kind of event it may be?

Fred Alan Wolf: If there is a possibility for destruction of a whole universe, there may also be the possibility for destruction of a parallel universe. Parallel universe events don't interact like cars bumping into each other on the street. So it would be a series of events such as being swallowed up by a huge black hole that ate everything in a universe.

\*I have heard that the *déjà vu* experience can be explained using parallel universes theory. Is it true?

Fred Alan Wolf: Possibly true, and possibly another interpretation of quantum physics can explain it. In my book *Parallel Universes*<sup>2</sup> I offered the following story illustrating how Parallel Universes theory could explain it:

#### THE SPOUSE-OF-THE-DAY

In a tiny village in New Hampshire, Mr. Jones goes to sleep next to Mrs. Jones, one quiet Sunday evening. Nothing unusual about that. Mrs. Jones smiles at her husband sleepily, and remembers the violets he managed to bring home for her birthday--something he never seems to manage to do because the poor dear works so hard at the office. She really thinks he spends too much time at the office these days and wonders if he really should. These late night meetings are a bit of a strain for her. But Friday-last he did remember. She is really quite pleased that he brought the flowers even though she has hay fever--something he never can seem to remember even after fourteen years of marriage--or is it thirteen? She falls asleep and dreams of knights carrying her from one castle to the next.

When she wakes up next morning there lies Mr. Jones. Alongside of the bed she sees the familiar shine of his heraldry brimming with reflected light from his shield. The familiar sounds of the peasants working in the fields fill her ears and the smell of horses from the king's stable reaches her delicate and sensitive nose. She awakens with a start and immediately begins one of her sneezing attacks.

Mr. Jones wakes up surprised to be arising so early on a Monday morning after chasing bandits out of the castle stronghold last night. His wife smiles at him, "Sor-ree. But you do know how flowers make me sneeze. They are such lovely violets, but dear, pay a little more attention to me and try not to spend so much time at the round table drinking beer and listening to that old fuddy tell such stories."

Mr. Jones, sir Lancelot Jones, esq., to be more exact, looks down at Lady Gwen Jones wondering if this was the same woman he married thirteen years ago.

The above episode implies that there are really two Jones's. One couple lives in the present and the other in the past. They are really split off from the same Jones' egos.

Now I've carried the story a bit far by placing the alter-egos in two different time periods. Perhaps the future Jones's are in communication with the past Jones's. In fact this maybe how the mind or memory works. All time exists now and memories or anticipations are messages from parallel worlds that exist in the future and the past, but at the same time all lying side-by-side in the present.

\*How do you think: can we use parallel universes to improve our life?

Fred Alan Wolf; By helping us to use our imaginations to envision more possibilities in our lives.

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<sup>2</sup> *Parallel Universes: The Search for Other Worlds*, for Simon & Schuster, NY. 1989, Touchstone: 1990. Also Published the UK and in German as *Parallele Universen: Die Suche nach anderen Welten* by Insel Verlag, in Italian as *Universi Paralleli*, by Geo, and published in Japan by Tokuma Shoten.