

A Request for proposal.

Abstract: The purpose of the proposed experiment is to evaluate the validity of the fundamental assumption that space-time is a human being's own (characteristic of human being). The recent highlight, of cognitive properties of humans under situation of specific interactions with the outside world, allows to think that with this experiment we will be able to identify the reasons for some specific quantum mechanics oddities.

First of all, this request for proposal is for a team of neuroscientists controlling brain imaging and prior master protocol definition that allows interpreting the results obtained afterwards in relation to the assumptions involved as firmly as possible.

Taking into account the recent results of the publications I will mention below, as one goes along, in this article, and the first assumptions that I have developed this past decade¹ ;² ;³, the experiment proposed gathered, at that time, all the ingredients which allowed us to think that from this experience we will be able to extract new understandings about the interaction between human beings and nature on the scale of the infinitely small.

The first fundamental assumption that I do is that space-time is a peculiarity to humanity that is, these four dimensions are based on human being from an origin which is probably located at the first time of hominization, i.e. about the order of 2 million years ago or more. I would say space-time is a concept that emerged when a first intelligence invested the need for this concept to be situated on planet Earth in a non-instinctive way. It is important to stress the concomitance of these mutual emergences. I quote: « 'Your Brain Is a Time Machine'⁴ reveals how the enigmatic fourth dimension is essential to our existence and, indeed, fundamental to what makes us human ». So, one must consider that space-time has the value of a determination of the human being.

The experience is intended to see, or not, this determination inherent in the human being. Recent results of experiments reinforce the idea that prospects of discoveries and new understandings would be inferred with this project experience. I quote: 'Our brains prefer

¹ A world in 'Presence' : viXra : 1211.0149

² A world in 'Presence' II : viXra : 1301.0157

³ Space-Time has a Source... But not a Quantume Source : viXra : 1512.0339

⁴ Dean Buonomano's book : 'Your Brain Is a Time Machine ; The Neuroscience and Physics of Time' W.W. Norton Company, 2017.

invented visual information to the real thing⁵, and the author's comment: "The brain trusts its own generate information more than what it sees outside in the world". We quote still: "How quantum trickery can scramble cause and effect"⁶. In this article, the authors tell us: « we are now realizing that in quantum mechanics, it's not exactly what you do that matters, but what you know. » I note particularly that connection because actually, according to my hypothesis, the human being conveys deep knowledge and especially the specific baggage for a spatial-temporal knowledge of the point situated largely within the "complex entorhinal", see in Mauro M. Monsalve-Mercado et al. '*Hippocampal Spike-Timing Correlations Lead to Hexagonal Grid Fields*', *Physical Review Letters* (2017). DOI: 10.1103/PhysRevLett.119.038101 and also in 'Your Brain Is a Time Machine...', Dean Buonomano, page 182: "...that our ability to grasp the concept of time was coopted from the neural circuits that evolved to navigate, represent, and understand space", and more, page 206: "So most of our neural baggage comes from animals that lived, cognitively speaking, in the immediate present." In conclusion, the faculty to accede to a spatial-temporal knowledge is a deep and generic human faculty.

Consequently, taking account these results and statements that space-time is the own contribution of human being we would be able to identify the reasons for some specific quantum mechanics oddities. I refer to the N. Bohr complementarity's principle and the quantum superposition's principle. That means we are faced to the corpuscular aspect or to the undulatory aspect of the quantum object.

To achieve the proposed experience, we must select three categories of people. And thereafter use brain imaging resources. These three categories of observers are placed in front of an interferometer to observe the path of a quantum object within it.

Professional physicists educated in quantum mechanics and other observers educated only in wave physics, finally the third category does include that the non-educated in physics, especially those ignorant of what constitutes the field of the physics of waves. Then experience is to place, these three groups of people equipped with the means of functional MRI observation, successively before the same interferometer. The 1st experience is to observe the brain regions that are activated when a quantum object travels the Interferometer with information space-time everything along its path. The 2nd experience is

⁵ In eLife, DOI : 10.7554/eLife.21761

⁶ In Journal Nature, Volume 546, pages 590-592

identical to the 1st but with loss of spatial-temporal information because of the implementation of a semi-transparent device.

What would the possible results be?

a) with a spatiotemporal information on the trajectory, I hypothesize that the brain images would be similar for the 3 categories of people. And the aspect of the quantum object would be punctual.

b) with loss of spatiotemporal information in the path, let's assume that each of the categories of observers would show different brain images since the space-time identification of the brain area will not be solicited or will be taken in default.

In the case a) the space-time identification is an old story, human being has acquired for a long time (with evolution, he has obviously matured) and it could be that the active brain region, in this case, would be at the level of the cortex entorhinal.

In the case b) professional physicists intellectually equipped to compensate for the lack of spatiotemporal information will probably put in activity an area of the brain recently educated for wave representation. It will be important to be able to distinguish differences of brain images between those who have received education up to quantum mechanics and those who did not go beyond the physical wave.

In case b) non-professional physicists will have no alternative to the representation of the object that they do not see in space nor in the travel time in the Interferometer. As a result, according to the proposed hypothesis, the brain images that they will deliver should be very different.

For good reasons, a priori, we can speculate that much of the strangeness of quantum mechanics does not only come under space-time. Yet there are theoretical results of Carl Bender that deserve to be meditated⁷. I cite him: « For example, why are the energy levels in an atom quantized? Why can the atom only have certain energies or not others? We don't understand this because we don't look in the complex plane. In the complex plane, the energy levels are quantized. They are smooth and continuous. But if you take a slice through the complex plane along the real axis, the energy is chopped

⁷ Phys.org, 11/01/2016: 'Physicist honored for finding new symmetry in space and time.

into disconnected points. It is as though the ramp was removed from a multi-level parking garage, leaving disconnected levels.”

However, if the fundamental hypothesis is validated, it will be possible to explain the phenomenon of entanglement.

If discovered, as I make the assumption, that spacetime is not given in Nature but is a construction of the mind, we have not lost any referential stable to decrypt the universe because the light is, it is certainly present in the nature of our universe.