VOID STRUCTURE

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In this paper we calculated volume occupied by matter in the brain In the case of brain the binding energy is the first and fundamental quantum property of the brain. The structure of the brain is rather strange The matter is from macroscopic point of view absent! Human brain is empty of the matter. We argue that considering mass contents human brain is the sphere of the radius of 0.1m with nucleus of the radius of (10^{-15} m^3)$^{1/3}$= 10^{-5}m

I always think love is a little as cosmology. There is a Big Bang, a lot of heat, followed by a gradual and a cooling off drifting apart and cooling off which means that a lover is pretty much the same as any cosmologist

Philip Kerr

Quantum theory provides us with with a strinking illustration of the fact that we can fully understand a connection though we can only speak of it in images and parables.

Werner Heisenberg

1. Introduction

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In the preface to the first (German) Edition of the book "Collected Papers on the Quantum Mechanics" , Zurich 1926 E Schrodinger wrote: a young lady friend recently remarked to the Author (Schrodinger) "When you began this work you have no idea that anything so clever would come out of it , had you "
This unorthodox comparison between scientific and purely aesthetic communication is able to provide a first clue towards criteria distinguishing good fantasy in science from bad. Science as a crowning intellectual achievement is essentially disciplined; but it is not always easy to realize the need for an equally severe discipline in the domain of the imaginative arts. Imagination and intellect, however, are not always in antithesis to one another. Reason
implies not only a capacity for logical sequence of argument, but also a sensitivity to balance and contrast a trained intuition without untrained intuition

s arrogant claims to short-circuit the discipline of the intellect When the imagination thus becomes disciplined, and undertakes the severest obligations inherent in perfecting the pattern of an art-form, it has taken the essential step towards security against the weaknesses of fantasy. Structure as disciplined as that of a mathematical argument is capable of transfiguring the merest nonsense into divine nonsense.

Modern physics might well be regarded as study of the structure of matter and of the behavior of radiation. A criterion for success pursuit of the former study demands that analysis of material structures into atoms and molecules, and of these into nuclei with groups of associated electrons, must be capable of giving rise to verifiable prediction of the bulk properties of matter, mechanical, thermal, chemical, and electrical. Criteria for theories as to the behaviour of radiation are that the phenomena of light, colour, radio, X-rays, heat radiation, must become explainable by some single mechanism; the only mechanism so far successful has been the propagation of electric and magnetic quantities with a unique and universal speed which is accurately measurable. This speed exceeds that of the fastest material particles, as a limit towards which the latter can only approach. Within the scope of these two most general schemes, the structure of matter has been a prime example of pattern since D Mendeleyev in XIX century arranged all the then known chemical species or elements into a two- dimensional framework. Written down in a table of horizontal rows and vertical columns, the chemical elements were found to repeat certain properties periodically, much as the harmonic properties of the notes on a piano keyboard repeat themselves at intervals of octaves. To form the gross substances which we distinguish by touch, smell, taste, etc., the affinities for chemical combining of atomic species are found to wax and wane with precise regularity throughout the periods of this table. The whole assemblage of empirically periodic patterns is now understood as manifesting the way in which successive electrons can become associated with atomic nuclei of definite mass: these additions proceed

until one after another their possible federations into electrically and mechanically stable groups or sub-patterns are.

There have been eras in which an educated man could only live up to his standard if he were at the same time a poet and a philosopher and an experimental or mathematical researcher. E. Schrodinger is a good example. He attended a gymnasium , which emphasized the study of *Greek* and *Latin* classics. His book Nature and the Greeks published in 1948 is an elegant exposition of ancient physical theories and their relevance. Schrodinger wrote in 1925 an intensely account of his beliefs, *Seek for the Road*. The book was influenced by *Hinduism* and is an argument for the essential oneness of human consciousness.

2. Void of Human Brain

It is well known that the mass of human brain equals 1,5 kg,

Table 1 (Wikipedia)

Brain sizes of hominids	
Name	Brain size (cm^3)[1]
Homo habilis	550–687
Homo ergaster	700–900
Homo erectus	600–1250
Homo heidelbergensis	1100–1400
Homo neanderthalensis	1200–1750

Homo sapiens	1400

On another side human brain consists of 10^{11} neurons with mass of each equals 10^{-8}kg. (Kandel E R, 2012) We have the serious problem: mass of all neurons is equal 10^3 kg – is impossible great and is greater that the full body of an adult human. In our paper (Marciak-Kozlowska, Kozlowski 2017) we solved the dilemma. It occurs that new formula for mass of brain can be written as

$$M_{HB} = N_N \bullet 10^{-5} g - B_E \qquad (1)$$

In formula (1) M_{HB} denotes Human brain mass, N_N is the number of neurons in human brain and B_E is human brain binding Energy. The binding energy was calculated in our earlier paper (Marciak-Kozlowska, Kozlowski,2017)

and equals

$$10^{30} GeV \qquad (2)$$

From formulae (1,2) we conclude that the binding energy contributes about 99% of the mass of human brain Binding energy is the *biological dark energy* The same situation is for proton structure.

Table 2, Radiuses

Nucleus	10^{-15}m
Atom	10^{-10} m
Human brain	10^{-1}m

The mass of a proton is about 980 MeV. By comparison the " bare " mass of an up quark is around 2 MeV and the bare mass of down quark is 5 MeV. A proton has two up quarks and one down quark , which combined contribute to only about 10 MeV. The rest of the mass about 970 MeV, comes from binding energy .

Let us start with the inner structure of human brain. Average human brain volume is equal 1.2 $10^{-3}m^3$. On the another hand the volume occupied by all protons in human brain is 10^{30} x$10^{-45}m^3$=$10^{-15}m^3$ (Table 2) Rest of volume of human brain is empty of matter and consist of biding energy-. As it concerns matter human brain is void!

Conclusions

In this paper we calculated volume occupied by matter in the brain In the case of brain the binding energy is the first and fundamental quantum property of the brain. The structure of the brain is rather strange The matter is from macroscopic point of view absent! Human brain is empty of the matter. We argue that considering mass contents human brain is the sphere of the radius of 0.1m with nucleus of the radius of (10^{-15} $m^3)^{1/3}$= 10^{-5}m

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