

STAIF II April 19th 2014

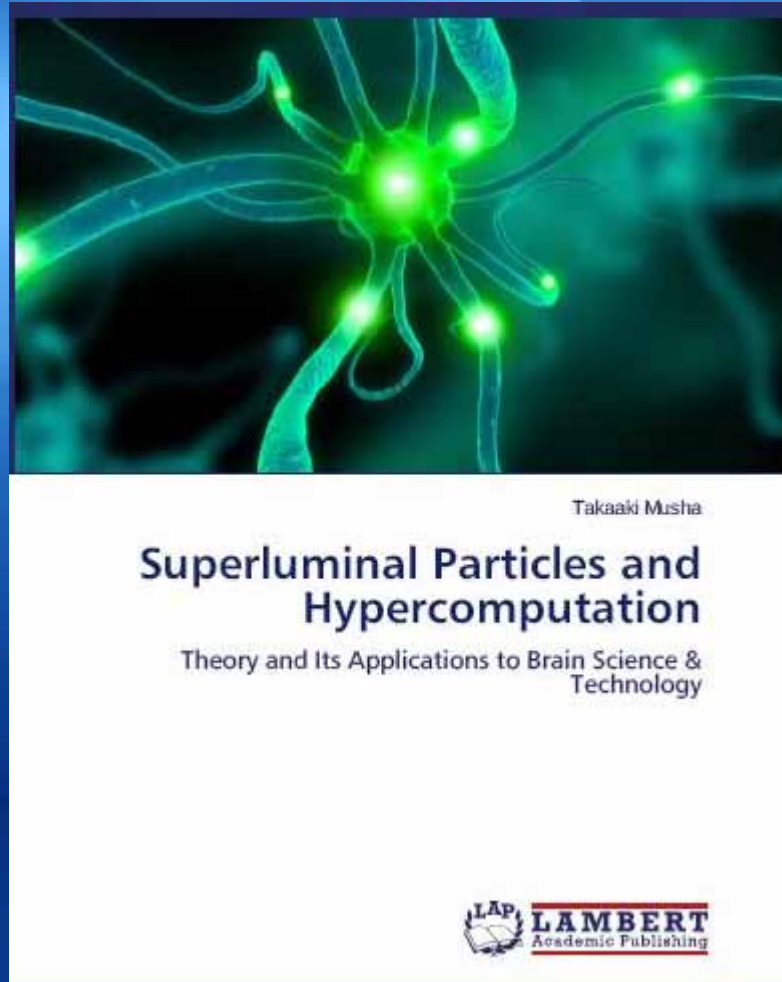
SUPER
wallpapers

Superluminal Particles and Hypercomputation



Takaaki Musha as presented by Morgan Boardman

“Superluminal Particles and Hypercomputation” authored by T. Musha



Publisher: Lambert Academic Publishing in Germany

Summary of Musha's theory

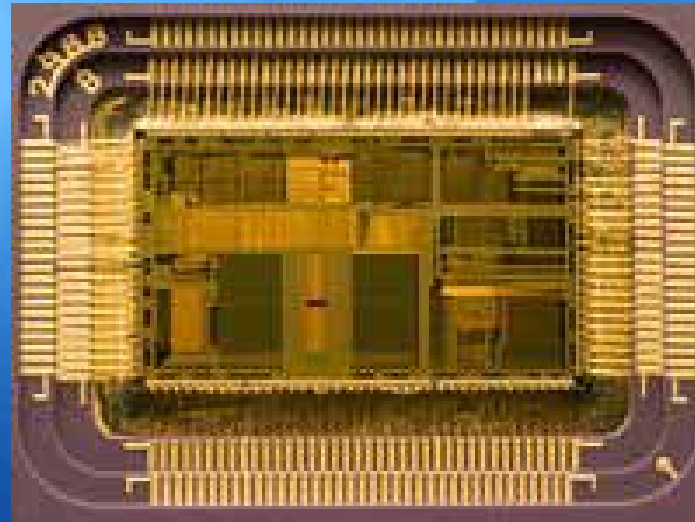
- In mathematics and computer science, an accelerated Turing machine is a hypothetical computational model related to Turing machines, which can perform the countable infinite number of computational steps within a finite time.
- It is also called a Zeno machine, the concept of which was proposed by B.Russdel, R.Blake and H.Weyl independently, which performs its first computational step in one unit of time and each subsequent step in half the time of the step before, that allows an infinite number of steps to be completed within a finite interval of time. Zeno machines allow us to compute some functions those are not Turing-machine computable and it is known that the halting problem for Turing machines can be easily solved by them.
- But this machine cannot be physically realized from the standpoint of the Heisenberg uncertainty principle, because the energy required to perform the computation will be exponentially increased when the computational step is accelerated. Thus it is considered that the Zeno machine is mere a mathematical concept and there is no possibility for its realization in a physical world.
- From the assumption that the evanescent photon is a superluminal particle, the author has studied the possibility to realize the high performance computing system by utilizing superluminal evanescent photons and he has shown that the microtubular structure of neurons permits the human brain to function as a quantum hyper-computational system at the room temperature. By applying these results, it can be shown the possibility to realize a hyper-computational system which has a capability to function beyond the ordinary Turing machines by the information processing conducted inside macrotuble structures of neurons from the standpoint of superluminal particles.

Contents of the Book

- **1. Introduction**
- **2. Possible Existence of Superluminal World Beyond the Light Barrier**
- **3. Hypercomputer from the Standpoint of Superluminal Particles**
- **4. Possibility of Quantum Computation in the Biological Brain**
- **5. Holographic Memory Inside the Human Biological Systems**
- **6. Super Coherent Organism via Tachyon Field**
- **7. Superluminal Universe Hypothesis Proposed by Prof. Dutheil**
- **Conclusion**

Model of Reversible Computation proposed by Feynman

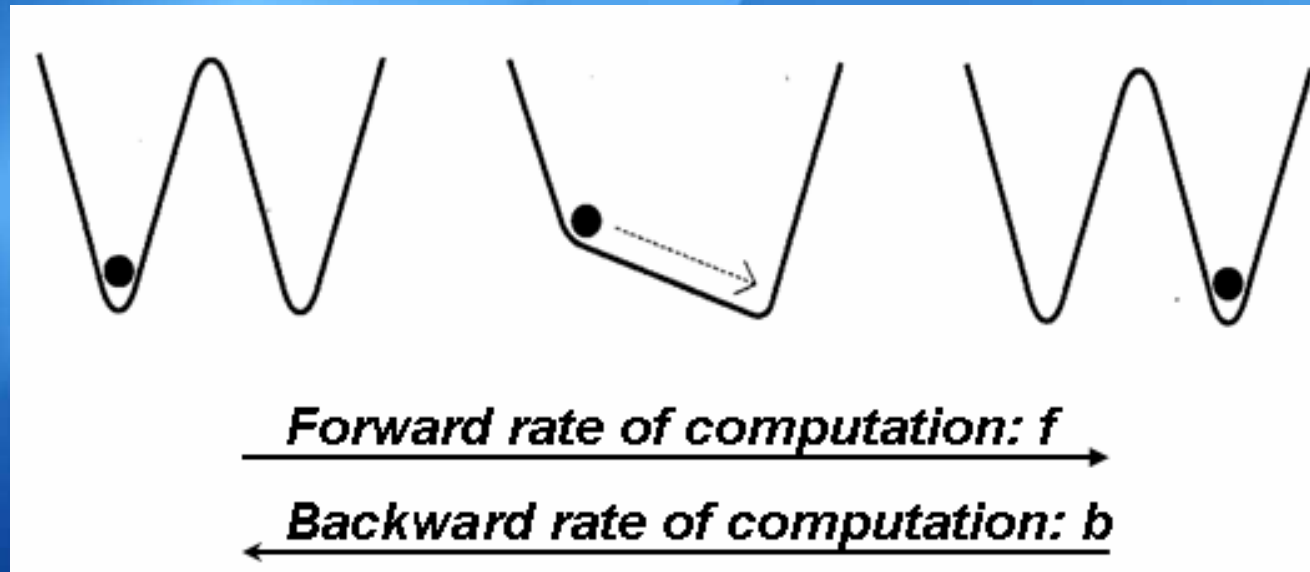
Computer processor



$$\text{energy per step} = k_B T \frac{f - b}{(f + b)/2}$$

where k_B is Boltzmann's constant, T is a temperature, f is a forward rate of computation, and b is its backward rate.

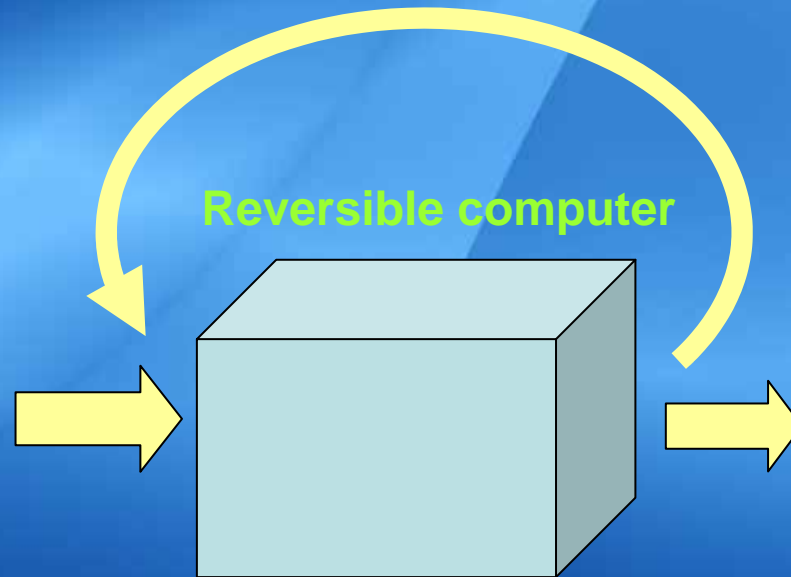
Energy for infinite computational steps



$$E_1 = kE_0, E_2 = kE_1, E_3 = kE_2, \dots E_n = kE_{n-1}, \dots$$

$$k = 2(f - b)/(f + b)$$

Energy loss for each computational step



(Energy loss for each step)

$$\Delta E_1 = E_0 - E_1 = (1 - k)E_0$$

$$\Delta E_2 = E_1 - E_2 = (1 - k)kE_0$$

⋮

$$\Delta E_n = E_{n-1} - E_n = (1 - k)k^{n-1}E_0$$

Time required to complete the infinite steps of computation

(Margolus and Levitin equation to perform logical operations)

$$\Delta t = \frac{\pi \hbar}{2 \Delta E}$$



(Total time for computation)

$$T = \sum_{n=1}^{\infty} \Delta t_n = \frac{\pi \hbar}{2 E_0} \sum_{n=1}^{\infty} \frac{1}{(1-k)k^{n-1}}$$

For ordinary particles
(electron, photon)



Computation cannot be completed
within a finite time.

Evanescent photon in a superluminal mode

(Klein-Fock-Gordon equation)

$$\left(-\frac{1}{c^2} \frac{\partial^2}{\partial t^2} + \nabla^2 - \frac{m_*^2 c^2}{\hbar^2} \right) A(x, t) = 0$$



$$A(x, t) = A_0 \exp\left[-\frac{Et + px}{\hbar} \right]$$



Tunneling photons traveling in an evanescent mode can move at a superluminal speed.

Uncertainty relation for the supeluminal particle

$$E^2 = p^2 c^2 - m_*^2 c^4$$

Relativistic equation for superluminal particles



$$\Delta p \approx \frac{v}{c^2} \Delta E \quad \text{if} \quad \Delta v / v^2 \approx 0$$



Uncertainty principle for Superluminal particles

$$\Delta E \cdot \Delta t \approx \frac{\hbar}{\beta(\beta - 1)}$$

where $\beta \approx 1 + \frac{c}{2\omega d} + \sqrt{\frac{c}{\omega d} + \frac{c^2}{4\omega^2 d^2}}$

Time required to complete the infinite computation for superluminal photons

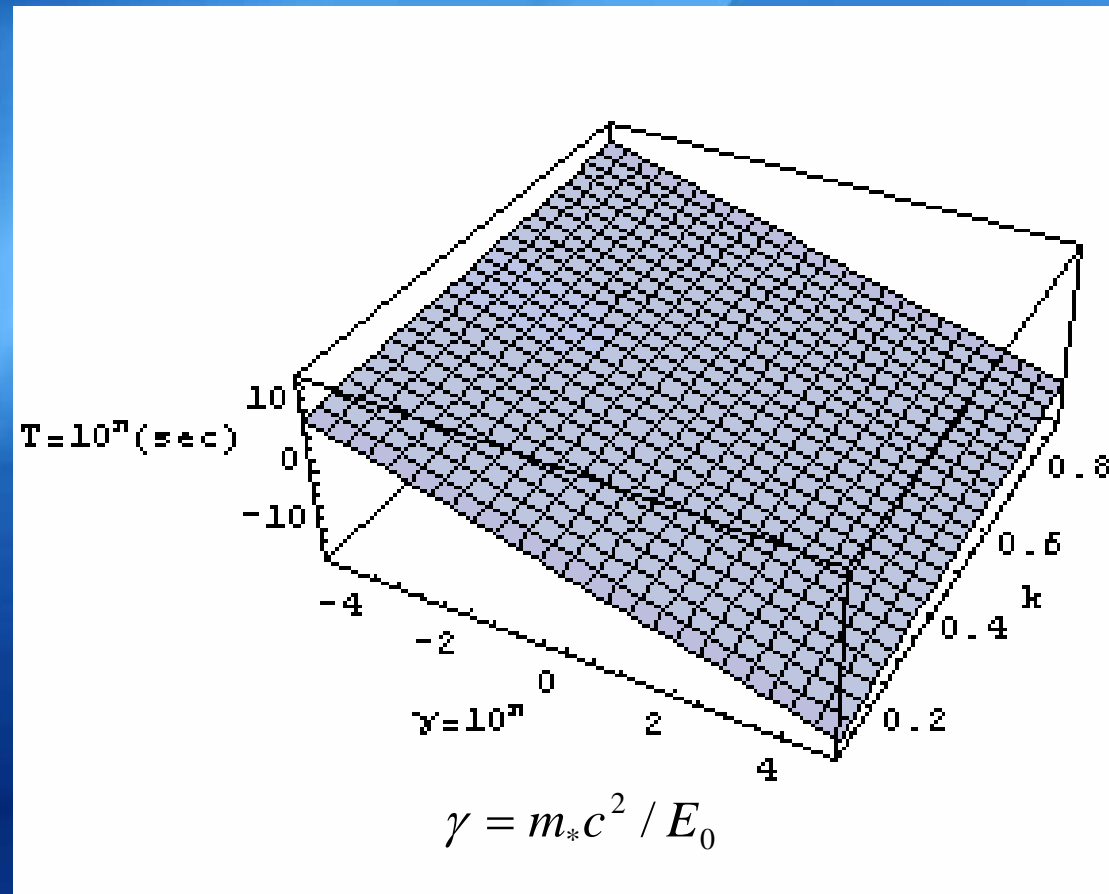
(Total time for computation)

$$T = \sum_{n=1}^{\infty} \Delta t_i = \frac{\pi \hbar}{2E_0} \sum_{n=1}^{\infty} \frac{1}{\beta_n (\beta_n - 1)(1 - k)k^{n-1}}$$

where

$$\beta_n = \sqrt{1 + \frac{m_*^2 c^4}{E_n^2}} = \sqrt{1 + \frac{m_*^2 c^4}{k^{2n} E_0^2}}$$

Result of mathematical calculation by Mathematica

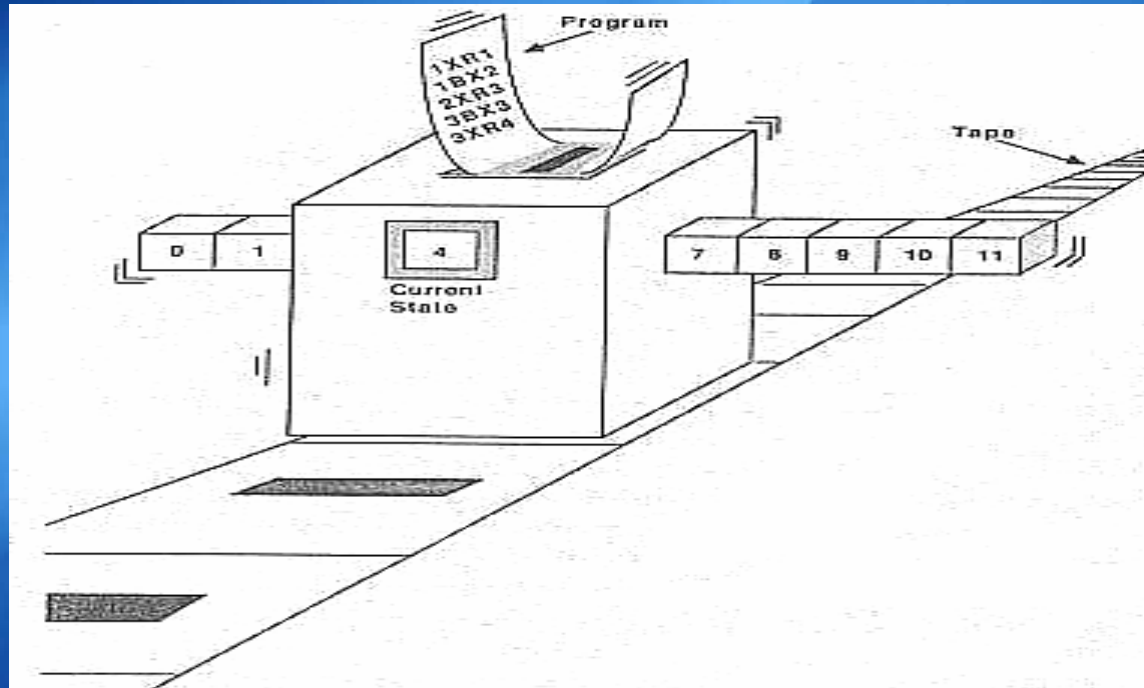


Infinite computation can be completed within a finite time
if we use superluminal particles.

Summary of the mathematical analysis

- Accelerated Turing machine cannot be realized for computers utilizing ordinary particles due to the uncertainty principle.
- Contrary to the above conclusion, superluminal particles permits the realization of an accelerated Turing machine.

Halting Problem of the Turing Machine



(Halting problem)

Given a description of an arbitrary computer program, decide whether the program finishes running or continues to run forever.

This is equivalent to the problem of deciding, given a program and an input, whether the program will eventually halt when run with that input, or will run forever.

Halting problem can be solved by using the Zeno Machine

Halting problem can easily solved by using the following pseudocode algorithm

```
begin program
  write 0 on the first position of the output tape;
  begin loop
    simulate 1 successive step of the given Turing machine on the given
    input;
    if the Turing machine has halted, then write 1 on the first position
    of the output tape and break out of loop;
  end loop
end program
```

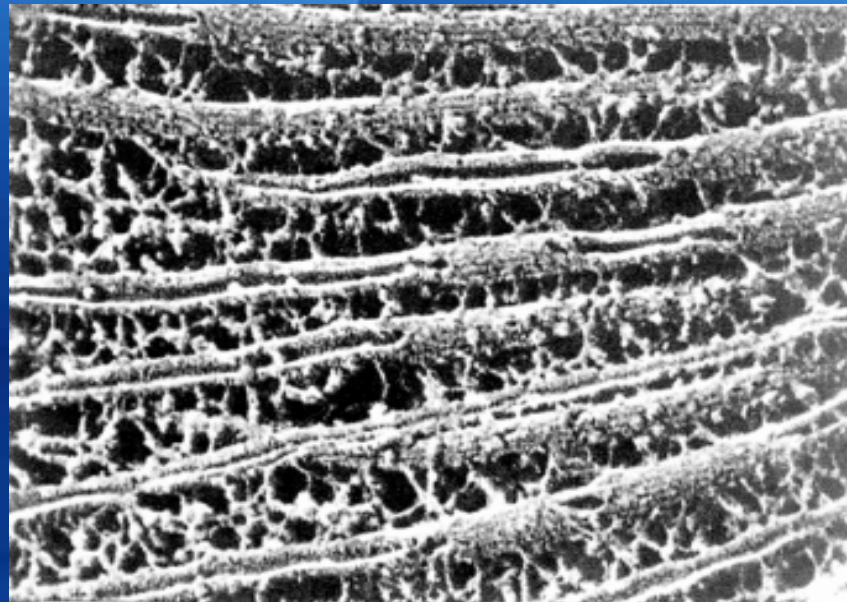


By using the superluminal particle, there is a possibility to realize the hyper-computational system.

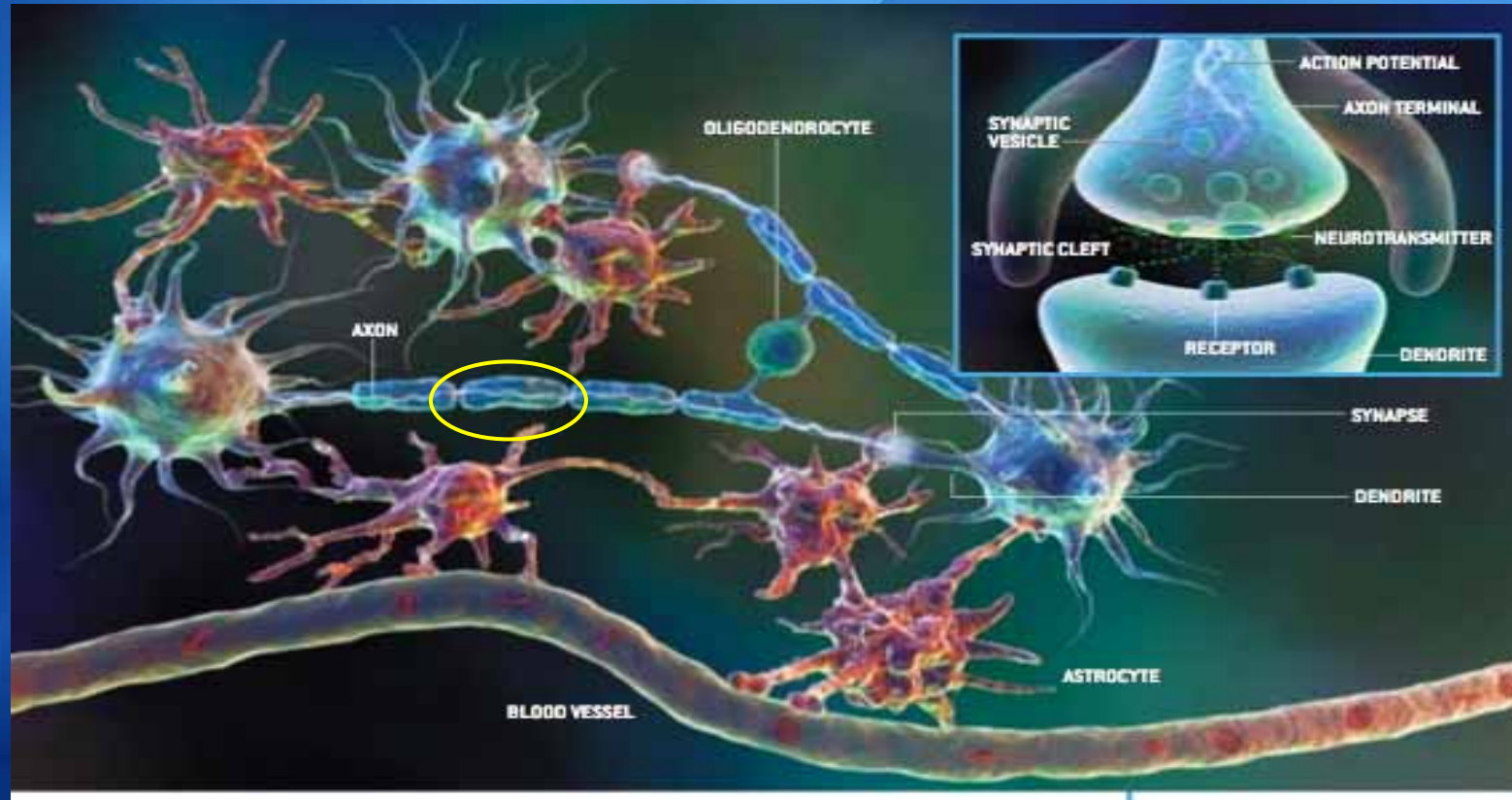
Hypothesis for the Brain function

The conscious process in the brain was related with the macroscopic condensates of massive evanescent photons generated by the Higgs mechanism
(by Jibu et al)

Human Nerve System is operated by superluminal photons?

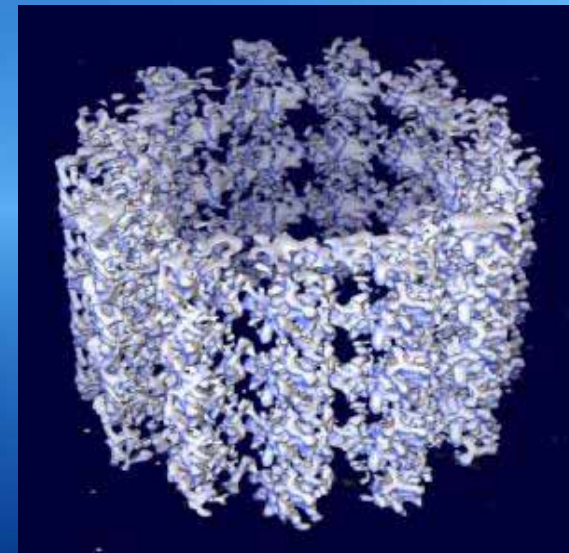
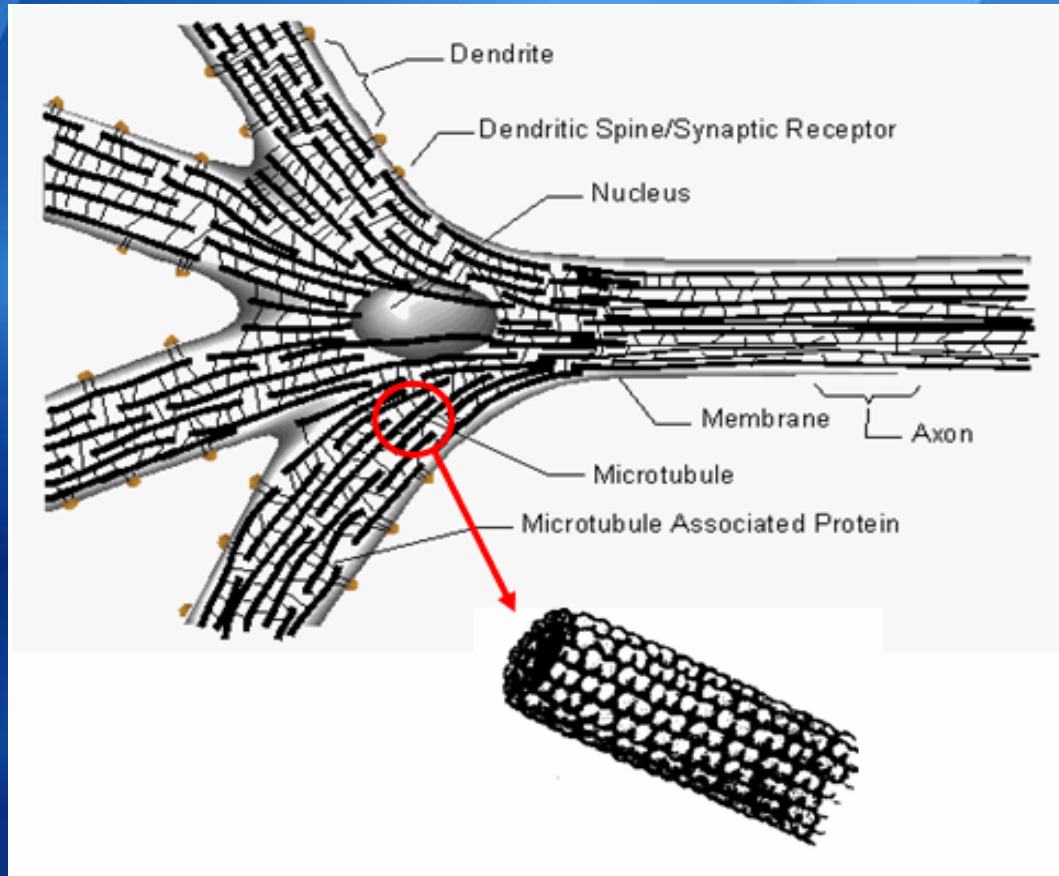


Structure of the human nerve system



Specific form of quantum computation is conducted at the level of synapses among brain neurons suggested by Hemeroff and Penrose.

Structure of the microtubule



Microtubule structures

Microtubules in brain neurons function as quantum computers (Hameroff, Penrose)

Quantum decoherence time of the human brain

Unruh (1995)

The time required in quantum computation must be less than the thermal time scale $\hbar/k_B T$, which yields 2.6×10^{-14} sec at the room temperature (20°C).

Tegmark (2000)

$$\tau \approx \frac{D^2 \sqrt{mk_B T}}{Ngq_e^2}$$



Microtubules would cause decoherence on the order of $\tau \approx 10^{-13}$ sec, which is slower by a factor at least 10^{10} than the time scale of neuron firing, $\tau \approx 10^{-3} \sim 10^{-4}$ sec.

It is impossible to perform quantum computation in the wet warm brain at the room temperature.

Instead of conventional physics, we assume that quantum computation in the brain utilizes superluminal photons.

Minimum energy required to perform quantum computation

(Subluminal particle)

$$E_0 \approx \frac{\hbar \nu_G L}{T} 2^L$$

(Superluminal particle)

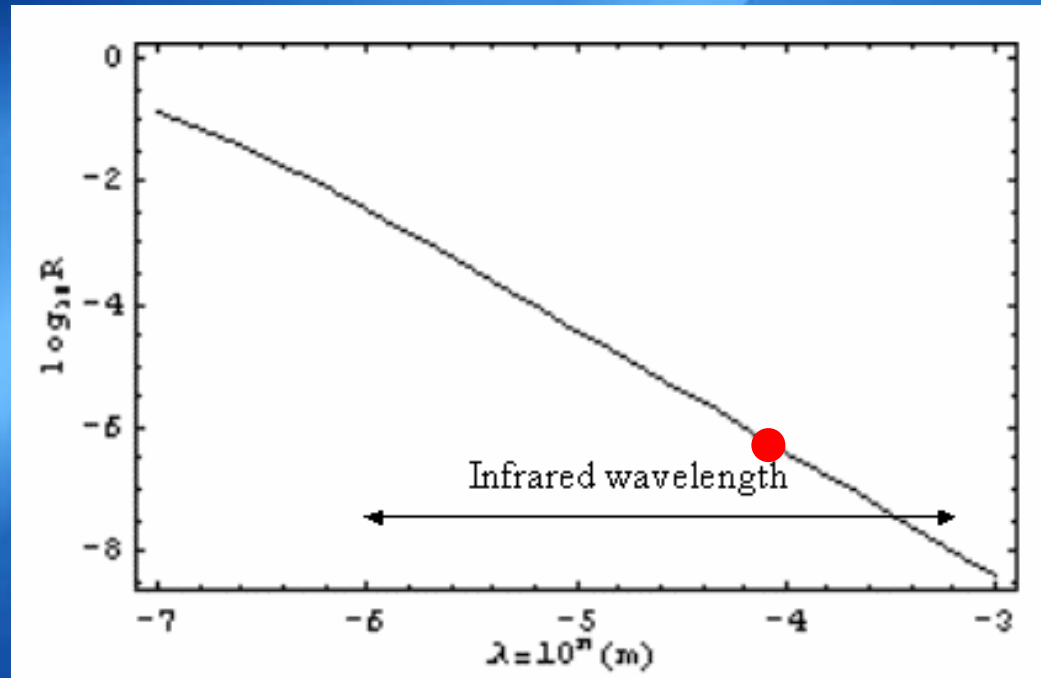
$$E'_0 \approx \frac{\hbar \nu_G L}{\beta(\beta - 1)T} 2^L$$

$$\beta \approx 1 + \frac{c}{2\omega d} + \sqrt{\frac{c}{\omega d} + \frac{c^2}{4\omega^2 d^2}}$$

(A) Energy ratio of them

$$R = \frac{\langle E_* \rangle}{\langle E \rangle} \approx \frac{1}{\beta(\beta - 1)}$$

Ratio of the energy (human brain/silicon processor)



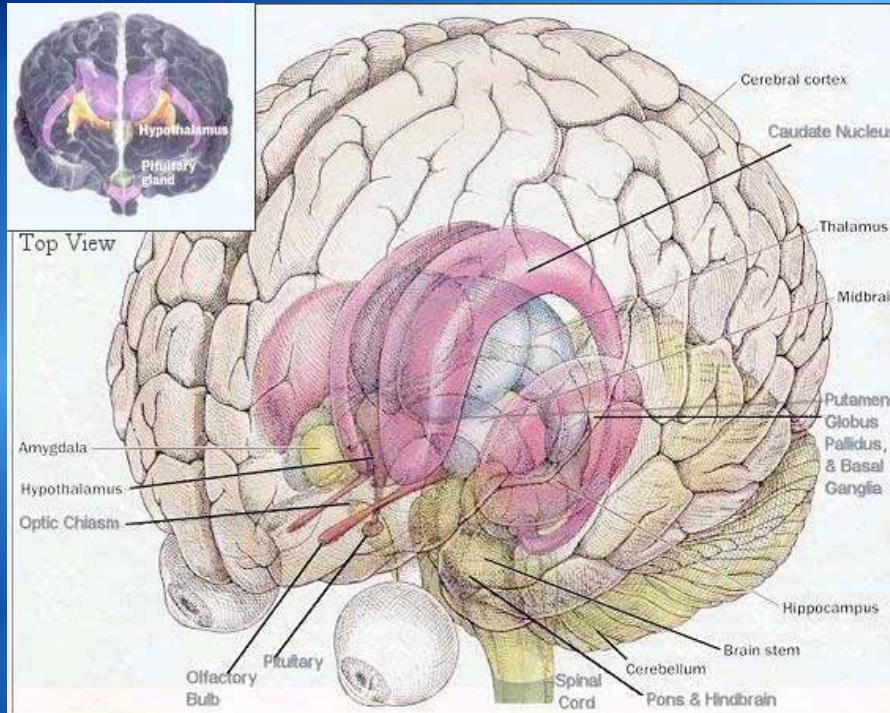
As human brains consume the energy 500kcal per day, the energy ratio of the human brain and the silicon processor becomes

$$R = 4.2 \times 10^{-7}$$

which is similar to the calculation result obtained from the theory.

Human brain is a very efficient system which requires very low energy compared with silicon processors to perform computation at the room temperature.

Decoherence time obtained from the tachyon hypothesis



Decoherence time (L.Diosi, 2005):

$$t_D = \frac{\hbar^2}{\tau} \frac{1}{(\Delta E)^2}$$

$$\tau'_D / \tau_D \approx (\tilde{E}_0 / E_0)^2 = [\beta(\beta - 1)]^2$$

$$\tau'_D = \tau_D \times [\beta(\beta - 1)]^2 \approx 0.03 \text{ sec}$$

This satisfies the decoherence time, $10^{-5} \sim 10^{-4}$ sec, which is required for conducting quantum computation estimated by Hagen, Hameroff and Tsuzynski, and that also satisfies the time scale of neuron firing given by $\tau \approx 10^{-3} \sim 10^{-4}$ sec.

Summary

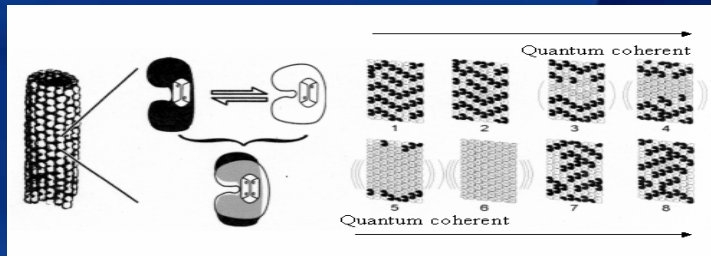
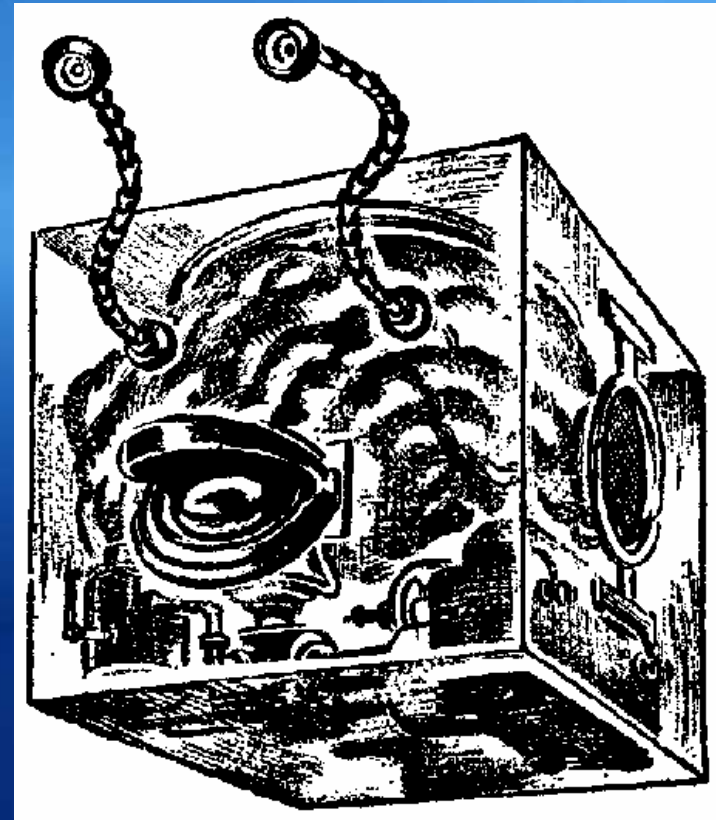
- From the theoretical analysis, it is seen that the accelerated Turing machine called a Zeno machine has a possibility to be realized by using superluminal particles from the standpoint of quantum mechanics. Thus an extraordinary capability of human brains compared with the ordinary silicon processors might be explained if they are composed of superluminal photons, because they have a capability to function beyond the ordinary Turing machines.



Human mind is a hypercomputer as claimed by J.R.Lucas.

Hyper-computational System like a Human Brain

Quantum computer system can be realized by evanescent FTL photons



Signal processing in the Brain

Artificial brain is possible?

Hypothesis based on superluminal consciousness by Dr. Dutheil



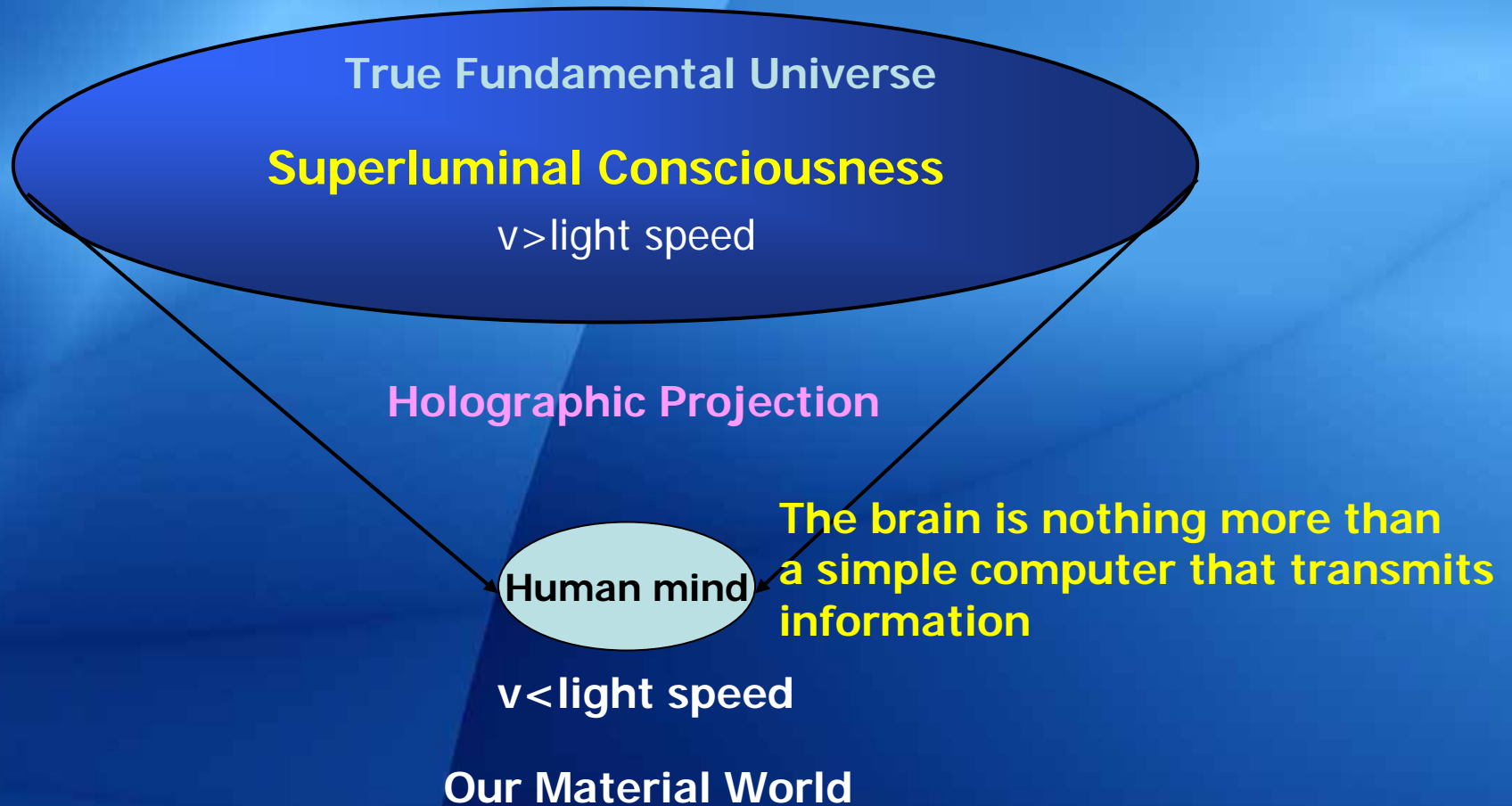
His hypothesis included in his book, "L'homme superlumineux", is based on a model in which consciousness is a field of tachyon or superluminal matter belonging to the true fundamental universe.

The proposed theory of Quantum Computation in the Brain from the Standpoint of Superluminal Particles coincides with the Hypothesis based on superluminal consciousness by Prof.Dutheil

(Hypothesis by Prof.Dutheil)

- The brain is nothing more than a simple computer that transmits information.
- Consciousness, or the mind, is composed of a field of tachyons or superluminal matter, located on the other side of the light barrier in superluminal space-time.

Structure of the World by Prof. Dutheil



Non-locality of wavefunction for the tachyon field

(Feinberg equation)

$$\left(\frac{\partial^2}{\partial t^2} - \nabla^2 - \mu^2 \right) \phi = 0$$

$$\phi_k(x) = \frac{1}{(2\pi)^{3/2}} \exp[i(\mathbf{k} \cdot \mathbf{x} - \omega t)] \equiv \frac{1}{(2\pi)^{3/2}} \exp(ikx)$$



$$\varphi(x) = \int \phi_k(x) f(k) d^3k \neq \delta^3(x)$$

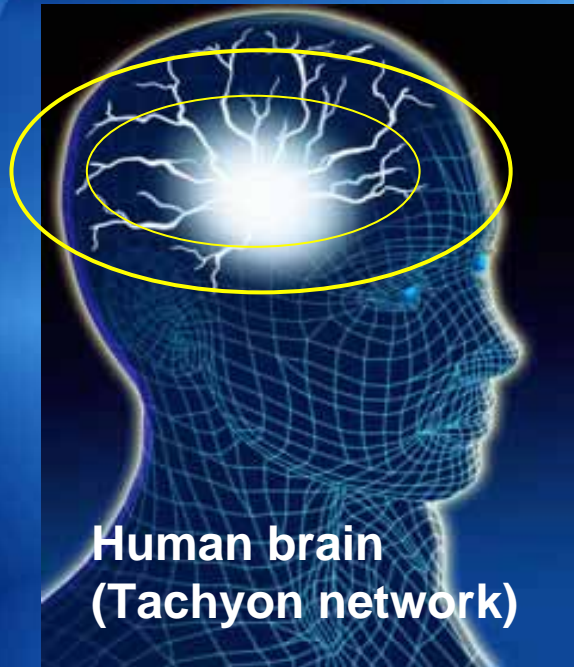
The tachyon cannot be localized in space from the superposition of solutions given by Feinberg. Such a quantum superposition cannot be made to vanish outside the sphere of finite radius, but rather influence outside the biological systems.

THE SUPER COHERENT ORGANISM VIA TACHYON FIELD

proposed by Prof. Laszlo

- **The living organism is extraordinary coherent with the world around it, dynamically, almost instantly correlated with all other parts.**
- **The mind of one person appears able to act on the brain and body of another.**
- **Modern people display a capacity for spontaneous transference of impression and images, especially when they are emotionally close to each other.**

Decoherence time for the tachyon field in a brain



(Decoherence time)

$$\tau'_D \approx \tau_R \left(\frac{\hbar}{\Delta x} \sqrt{2mk_B T} \right)^2 [\beta(\beta - 1)]^2 \approx 2 \times 10^{-4} \tau_R \text{ (sec)}$$

where

$$\beta \approx 1 + \frac{c}{2\omega d} + \sqrt{\frac{c}{\omega d} + \frac{c^2}{4\omega^2 d^2}}$$



$\tau'_D / \tau_D = 1.3 \times 10^{12}$ for the case when we let $d = 15 \text{ nm}$, that is the same order as the extracellular space between the brain cells.

If we can extend the time of decoherence at will, we can communicate with the external field in a space consisted of superluminal photons, which we may call Universal Mind.

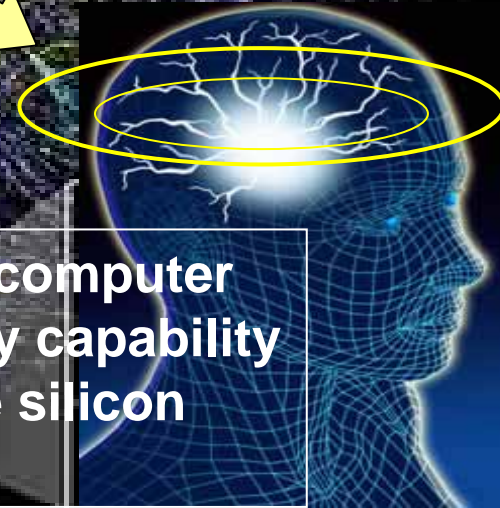
Interaction of the human brain with the Collective Mind via tachyon field

Human brain has the possibility to act as a unseparate whole.

Collective mind and the omnipresent tachyon field of Universe

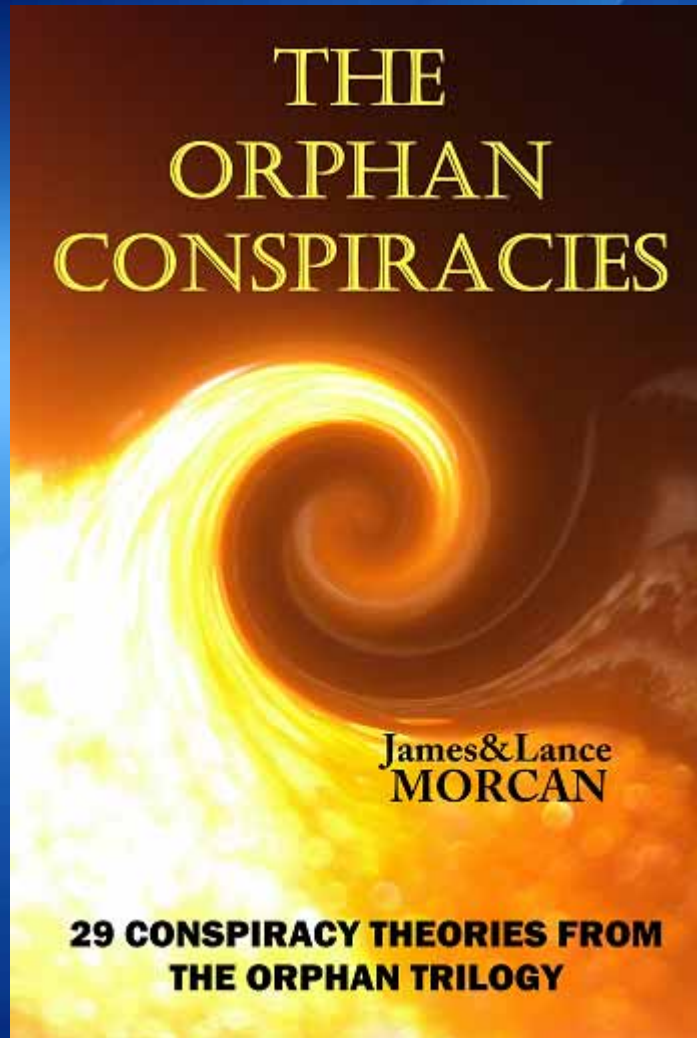
Non-local tachyon network

Human brains can act as a crowd computer system which has an extraordinary capability of computation compared with the silicon processors.



Conclusion from this theory

- Superluminal photons generated inside the biological system has the possibility to be entangled with each other via tachyon field created from the quantum vacuum around them. From which, it can be considered that superluminal photons in the biological material behaves as an inseparable whole and correlate with each other throughout the Universe. One might consider that the information of the DNA and gene's structure is available throughout the Universe via access to the omnipresent tachyon field.



The theory of superluminal computation is mentioned in the book, “The Orphan Conspiracies”, by James & Lance Morcan published from Sterling Gate Books, New Zealand.

A conjecture on quantum horizontal gene transference, entanglement, and transport

There is significant evidence to support further investigation into quantum level effects upon adaptive mutation and the possibility of quantum horizontal gene transfer. Some of the research conducted may indicate a capacity for not only transmission of a template, but also the transference of energy for transduction to begin the building of the base pairs necessary to replicate RNA or DNA at a distance.

One might consider that the information of the DNA and gene's structure is available throughout the Universe via access to the omnipresent tachyon field.
(by M.J.Boardman, JSE, Vol.2, Issue.3,2013)



The End