

The Cosmology of the Local Universe and the “measurement problem.”

The Local Universe (LU) is finite and has probably a 16.41866 billion light-years radius...

The definition of LU is the spherical region in space from which nothing escapes from that sphere, where light slows down until it stops (when the direction is normal to the surface), and γ -rays don't travel outside the borders. Thus, the James Webb telescope shouldn't discover signals over that distance even in infrared.

After the Big Bang, there was not an equal amount of matter and antimatter; there was a lot of matter and also a tiny amount of antimatter because of the mass Quark asymmetry and the Big Bang genesis. The initial explosion of the universe was from a huge, ultra-large Black Hole with a concentration of quarks of about a mile radius, and that's why the normal matter is predominant in the LU. Thus, the Primordial Black Hole appears 13.8 billion years ago. A very small version of it exists in the center of the Milky Way, the size between a basketball and a soccer ball soup of quarks. That is a consequence that according to onduscular theory, the gravity force is very high but not infinite in origin because of the granulation of space, thus there is no singularity at 0 points. The Schwarzschild radius of Black Hole in Sagittarius A (Milky Way) is

$R_{Sch} = \frac{2GM}{c^2} = 1.217 \cdot 10^{10} m$. The mass of our Black Hole in the Milky Way is $4 \cdot 10^6$ solar masses.

$R_{Sch} = 2953.4$ m for the Sun, and the ratio of a mile and 11.2cm in volume, thus the ratio is $2.96 \cdot 10^{12}$ of the Primordial Black Hole in the LU should have 10^{19} solar mass. This is the limit of the maximum mass of a black hole mass beyond which the pressure of quarks is so enormous pressure that it will blow up and is close to the mass of all stars in the Local Universe. The Schwarzschild radius of the Primordial initial Black Hole, using the same equation, is about 4 million light-years (more accurately equal to R, thus ~ 4.12 million light-years), and that was probably the inflation limit in space and time.

These are the questions that I ask Sir Profesor Kip Thorne:

1) The granulation of space, the dimension of Quarks is $4.3 \cdot 10^{-19}$ m, as in the document:

<https://arxiv.org/abs/1604.01280>. Is it possible that there should be a soup of quarks because it couldn't be smaller than the distance above the infinite value of gravity doesn't exist, it is huge but limited?

2) We know that nothing escapes from a black hole, even light, and neither does the graviton, so it is correct to say that stars are attracted and engulfed by the Blackhole but are not attracted by stars around. After all, it could be spinning but not moving because of the gravity of other stars?

3) Because the escape velocity from the Black Hole is greater than “c” for a photon or graviton, we can generalize that a pair of Blackholes do not change gravitons between them, but do attract each other?

4) The concern of creating an artificial Blackhole at CERN that engulfs the Earth is rubbish. We constate that science admits that there could exist a micro Blackhole is possible to create a controlled artificial micro Black Hole. Let's say by the resonance between LASER photons and gravitons?

5) The mass limit of a star from Chandrasekhar is equal to 1.4 solar masses, and the supermassive Blackhole of more than $\sim 10^{10}$ solar masses was found, which is a limit from the maximum mass of a black hole beyond the pressure of quarks crowded on an enormous pressure will blow up, and could we approximate that limit?

<https://www.esetscienceaward.sk/en/ask-kip-a-question?>

-Is correct to say that stars around are attracted and engulfed by the Blackhole but the Black Hole is not attracted by stars around it because the graviton from the Black Hole does not escape? -Thus, the Black Hole in the center of the Milky Way is not traveling because of the attraction of the neighboring Stars after all it could be spinning but not moving because of gravity.

-We know that nothing escapes from a Blackhole even light and also we can suppose that neither the graviton (because the escape velocity from the Blackhole is greater than “c” for photon or graviton either) so is correct to say that stars around are attracted and engulf by the Blackhole but the Blackhole is not attracted by stars around it because the graviton from Blackhole does not escape. Thus, the Black Hole in the center of the Milky Way is not traveling because of the attraction of the neighboring Stars after all, it could be spinning but not moving because of gravity?

Close but not right, a Blackhole does not emit gravitons but engulfs them, thus the attraction of it, by other stars is 60% of the force created by the law of gravity.

-We can generalize that a pair of Blackholes do attracts each other?

The correct answer is that the accretion disk of the matter around each Blackhole is attracted, thus there is a very slow dance in 4, we may say. That is in concordance with the astronomical observations of a long time of “gravitational negotiation between Blackholes”.

The minimum distance in the Black Hole of our Galaxy is $3.524 \cdot 10^{-25}$ m between the quarks, $2.556 \cdot 10^{-34}$ kg are crowded in the center of the BH, so the attraction force is limited to a finite value; there is no singularity in the way of infinite gravity in origin. Thus, the light travels that distance in $1.17548 \cdot 10^{-33}$ seconds.

Most of the process has a positive time arrow, and only a few have a spin projection quantum number of $\frac{1}{2}$, which is why antimatter is far less than normal matter.

We start with the supposition that the LU has existed for 13.79 billion years, and the expansion is made at the light speed by muon neutrino (μ), thus the event horizon of the observable universe is 16.418 billion LY, and due to the expansion of space, 93 billion light-years for light to travel comoving distance. Thus, the first stars appeared 431 million years after the Big Bang, and also appeared τ and μ neutrinos, thus time and space as we know it. We start from the moment that space, thus μ neutrino, was created 431 million years after the Big Bang, which is when the first stars were born, and at the present day, the distance is ~ 93 billion light-years.

After the Big Bang, there was inflation of about 4.12 million years. After that, there was a quark epoch period of nucleosynthesis of hydrogen and helium-4 when there was a very hot matter in expansion, and the universe cooled down. There were mostly hydrogen atoms and a kind of lower gravity between matter; there was nearly no space and no time: “A moment before the time at the place where there wasn’t space”. The dark period ended after 431 million years with the appearance of the First Star. The first day of the Local Universe took place after lower gravity produced the first huge star. In the first nuclear reaction, a miracle happened. It generated light (photos) and Tau neutrinos, thus Time. At the initial stage, the matter was in an amorphous state in the primordial stage; there was only mass. There was a slight dual manifestation of atoms and microparticles generated by ν and the non-created light of the neighboring boundary Universe. After the ignition of the First Star, the duality of the wave-particle due to the τ neutrino induced its rise in intensity. Suddenly, the τ neutrino of mass $\sim 0.188eV/c^2$ generates time and, in interaction with matter, strengthens gravity and generates expanding Space. According to the equation, gravity rises a couple of times as below, because the number of ν increases. Initially, there were only the transformations:

$$p + \hat{\nu} \xrightarrow{transf} n + posit \xrightarrow{decay} (p + e + \nu\hat{)} + \mu\hat{)} + posit = p + (e + posit) = p \quad (2)$$

And after muon neutrinos appeared, there was expanding space. It grows tenths to a time the reaction that generates an electronic neutrino ν and creates space that is a μ neutrino, a magnetron, and an Activate (Entanglement) particle. The A Entanglement appears at any interaction (emission or absorption) of Muon neutrino as an echo of muon neutrino and has the meaning of an Information Field that travels almost instantly in the hole LU.

$$p + \hat{\tau} \xrightarrow{transf} n + \nu\hat{)} + A\hat{)} + \pi^+ + \mu\hat{)} \xrightarrow{decay} (p + e + \nu\hat{)} + \mu\hat{)} + \{\pi^- + \pi^+ = p + (e + \pi^+) = p + \mu + \Delta E \quad (3)$$

The actual value of Tau neutrino mass is $\sim 0.188eV/c^2$, the non-created light that gives the Time & Energy of microparticles as in <http://www.michaelvio.byethost8.com/Hologram.pdf>

Muon neutrino mass is $\sim 0.0087eV/c^2$ and ν neutrino has a mass of $\sim 0.00038eV/c^2$ and we do not have a serious motive to say those ancient values were very different from the actual values. The Muon Neutrino is responsible for the mass matrix particle repartition. Those 2, the Higgs Boson & Muon Neutrino, are bonded together in the process of mass repartition and information of space.

After the distance of 8.3 million light-years between masses appears the rejection forces that push galaxies further away, then increase the void space between galaxies according to the onduscular equation that estimates the 5-th the torsion force of rejection.

From the apparition of the First Star, Space in the LU expanded with the speed of light determined by the speed of muon neutrino μ that travels at “c”. In a period of inflation, it is improper to say that the expansion was beyond the speed of light because there was no time or space information.

Thus, atoms receive quanta of energy for every predetermined period of around $\sim 4 \cdot 10^{-11}$ sec for a Hydrogen atom at room temperature, 1 „S” orbital. There is a reaction in which an electron collides with a τ neutrino, as in the equation below, where mag is an abbreviation for magnetron:

$$e + \hat{\tau} \xrightarrow{trans} e + A\hat{)} + \pi^+ + \pi^- + 2\mu\hat{)} + \Delta E \quad (5)$$

And τ neutrino will collide with a proton, generating the process of continuous migration of pairs of protons-neutrons generating gravity, magnetron for magnetism, and the μ neutrino that generates the hologram of space and A particle; we analyzed the Hydrogen atom.

In other heavier atoms, there must exist at least 2 nucleons in a specific amount of time of around $\sim 10^{-11}$ s (seconds) to interact (magnetron is a very light pion π with rest mass $0.007\text{eV}/c^2$) with pairs of binding spin proton-neutron that change state with each other and exchange magnetron.

As you can see from the initial proton in an atom nucleus emits a ν neutrino and a μ neutrino, absorbs a ν neutrino and a τ neutrino to trigger the reaction, and results in the pair of binding spin proton-neutron that change state with each other and exchange magnetron. In this way, the generation of gravity is provoked by the absorption and generation of a ν neutrino.

And the τ neutrino will collide with a proton, generating the process of continuous migration of pairs of protons-neutrons generating gravity, magnetron, and the μ neutrino that generates the hologram of space and A particle. That is in the nucleus, protons and neutrons are attracted by quantum magnetic forces and generate space information that travels almost instantly to the edge of the LU through the Activate particle. Thus, the A particle has a huge velocity in the LU and transmits the space matrix information to the closure of LU and has 0 rest mass. The A particle is associated with a transversal wave that propagates almost instantly, thus resolving the "measurement problem" because in LU there is no retrocausality in a usual experiment without the support of external energy.

Muon neutrino mass is $\sim 0.008\text{-}0.009\text{eV}/c^2$ and has a rest mass lower than the Mass Quanta $143.377\text{ KeV}/c^2$ and also less than the energy of an X-ray 65eV and thus can propagate with almost c speed. An electronic ν neutrino has an Energy of $\sim 0.00038\text{eV}/c^2$ and usually travels almost the speed of light.

Wheeler's delayed-choice experiment has a false explanation as retrocausality; it is the instant speed of the A particle that confuses. The usual experiment of retrocausality without the external support of energy in our LU is impossible because of the positive arrow of time.

Why is the speed of light the same in all inertial reference frames, even if the 2 particles are approaching one another at a percentage of light speed c ?

The same conundrum is apparent with the movement of any object through space. What is it moving relative to? The best theory comes from quantum physics, which suggests that every atom in the universe is "connected" to every other atom by a form of instantaneous action at a distance that stems from the moments after the Big Bang, when all matter was literally connected.

The explanation is astonishing to the macro level of reality, but what happened at the microcosmic level with 2 particles that are moving toward each other?

From the quantum point of view, those particles literally jump from one space quanta to another and are doing that with the c velocity, so at one moment in time is only a transition between two space quanta.

The space relativistic contraction that explains this is generated by the muon neutrino that rules the space.

<http://www.michaelvio.byethost8.com/grating.pdf>

Although in physics we say space is homogeneous in any direction and there is no privileged point in space, it seems that in the Local Universe, we can talk about the center of LU.

Starting from the Onduscular equation that should describe all the characteristics of the moving particle into the space coordinate and temporal determination, introducing the Wave Function which is the value of particle into the fabric of space-time at instant t and spherical, cylindrical, or cartesian cords; we start in spherical cords with a particle of rest mass m and velocity V and c the speed of light considering cylindrical symmetry. Starting from the Onduscular equation that should describe all of the characteristics of the moving particle into the space coordinate and temporal determination, Effective Onduscular Wave Function which in the fabric of space-time at instant t and spherical, cylindrical, or cartesian cords; we start in spherical cords with a particle of rest mass m and velocity as in T&SQ.pdf and calculus for γ ray:

<http://www.michaelvio.byethost8.com/GamCyl.pdf>

$V \sim 3 \cdot 10^{17}$ m/s and c , the speed of light, considering cylindrical symmetry:

$$\frac{r}{r} \frac{\partial^2 f(r,t,z)}{\partial r^2} = \frac{\partial^2 f(r,t,z)}{V^2 \partial t^2} \quad (1)$$

Where $f(r,t,z)$ is the effective wave function into the supposition that is separable in $f(r,t)=g(r)\cdot u(t)\cdot H(z)$ with the space function $g(r)$ and $u(t)$ a function of time. The γ -ray particle has a velocity “V”, with the propagation factor of $\sim 10^9$ times greater than “c”, thus $V \sim 10^9 \cdot c$.

The Dirichlet conditions are:

A) $[f(r,t) = 0 \text{ for } r=2\cdot R \text{ for any } t]$ EOWF $f(r,t)$ that can be replaced with $g(2\cdot R) = 0$;

B) $g'(1/R) = R$ for the initial derivative.

C) and that verifies the condition that the speed of interaction is the velocity V

This is the theoretical speed V, we are limited to movement inside the sphere of radius $R=3.9228\cdot 10^{22}$ m, thus the practical velocity limit of massless object $V_p \ll 3\cdot 10^{14}$ m/s. The equation of transversal speed

propagation in a liquid is $V = \sqrt{\frac{\chi}{\rho}}$ thus χ compressibility per ρ density, but in the supposition above and

the void space density of $9.9\cdot 10^{-30}$ grams per cubic centimeter ($9.9\cdot 10^{-27}$ kg/m³), thus $V=1.054\cdot 10^{18} \sqrt{\chi}$ velocity in m/s. The wave function Ψ with $t=0$ is:

<http://www.michaelvio.byethost8.com/PlanGam.pdf>

The compressibility modulus of space $\chi = 0.09070366748$ Pa, thus N/m maximum velocity is

$V \sim 3\cdot 10^{17}$ m/s <https://www.degruyter.com/document/doi/10.1051/978-2-7598-2574-5.c034/html>

As John Bell says in the paper “Against measurement” in August 1989: “I think it would be good to replace the word 'measurement' in the formulation by the word 'experiment'” For the latter word is altogether less misleading. However, the idea that quantum mechanics, our most fundamental physics theory, is exclusively even about the results of experiments would remain disappointing.”

Now let's take a closer look at the measurement action in an experiment to measure a microparticle mince to exchange energy with it, and we take a microparticle with a rest mass higher than the Mass quantum, thus an electron. The Heisenberg principle says that $\Delta t \cdot \Delta E = \hbar/2$, we have $\Delta t > T_{\text{Quanta}} = 1.765\cdot 10^{-19}$ sec, thus $\Delta E < 3729\text{eV}$. Usually energy level of the electron in an atom is less than a couple of tens of eV; thus, the time of interaction with the electron could be $\sim 200 T_Q = 4\cdot 10^{-17}$ sec, but the atomic quantum interaction time is even higher, $4\cdot 10^{-11}$ to $7\cdot 10^{-10}$, so we don't have a violation of the Heisenberg principle. How do we measure the electron parameters, say, velocity? We have 2 interactions with the electron in the initial state and final state to calculate the dynamic parameters of the electron by measuring the time that the electron flows the distance between the initial and final point. If the interaction energy in both states, initial and final, exceeded the τ neutrino energy, then energy per state = 0.094eV. The transition between an electron as a massive particle and a wave in $T_{\text{Qelectron}}$, the oscillating process will be blocked for several time quanta, and this fact will resonate almost instantly as information in the hole LU, also to the measuring device. This time of interaction will be higher than $7\cdot 10^{-15}$ sec, and the energy of interaction will be lower than above, so the duality of microparticle wave and concrete object won't be disrupted.

Now let's take a look at the measurement action of a microparticle with a rest mass lower than 413eV (the highest energy limit of X-ray photons). So we take a photon of energy, a couple of eV, and the process of the initial and final interaction should involve a relative entanglement between the photon and the measurement beam. The simple parameter that we can measure at the photons is energy, and the process should be destructive, such as converting photons into heat or partially modifying the energy of the photon. Let's take a usual photon close to the visible window, thus wavelength between 300 - 950nm and the energy domain 1 – 4 eV, and as in the case above, the disturbing energy should be lower than 0.188eV. But we have photo sensors that are functioning in the visible window, which is a 1-4eV interval. Thus, we need a different kind of observation. And that is possible with different kinds of detectors... a combination of infrared detectors resonating with visual pieces of information with a wavelength over 1 micron.

<https://medium.com/starts-with-a-bang/light-and-gravitational-waves-dont-arrive-simultaneously-edf80c8bad15>

12 Mar. 2026