

FMTI - PhysMath-Techno ideas for solving problems.

Sha S.V.

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1. Hypothesis of the formation of continents on Earth and seas on the Moon.

Sha S.V.

The Moon and the Earth are slowly moving apart and slowing down their rotation.

And several billion years ago, L and Z were so close that a day on Earth was equal to the Moon's revolution around the Earth. L and Z were always turned to each other with the same side. Naturally, the central parts of Z and L were shifted to each other and were not in the geometric centers. This led to the bulging of the Earth's continents towards the Moon. Similar processes occurred on the Moon, but it was colder, which led to the formation of lunar seas. (By the way, marsdmitri, a moderator from "All Physics" sfiz.ru, suggested to me that Soviet scientists have proven that every 160 million years the continents converge and diverge. This means that the Moon also converges and moves away from the Earth. Hooray!!!))) And Australian scientists consider the period of convergence and divergence of the continents to be 300-500 million years.

<https://lenta.ru/news/2022/10/03/ocean/>

And on 10/12/2022, scientists built a model of the distance and approach of the Earth and the Moon: <https://lenta.ru/news/2022/10/12/farfarmoon/>

By the way, the area of the continents roughly corresponds to the disk of the Moon. Or used to.

As the Moon moved away, the effect of these forces decreased, and the single continent began to split apart.

This process involves not only the force of the tides (otherwise the second continent would have formed on the other side of the Earth), but also the displacement of the Earth's core toward the nearby Moon. The latter caused the presence of one continent.

The tidal forces act on both sides of the Earth or the Moon, and when the Earth and the Moon come closer, the Archimedes forces manifest themselves in the inhomogeneous gravitational field of the Moon, therefore the continents of the Earth and the seas of the Moon are on one side of our balls.

The proximity of the core to one part of the Earth's crust caused it to heat up and rise, and the opposite side cooled down. The same mechanism can explain the formation of such a crustal structure that the oceans are still diametrically opposed to the continents. (Or it can be explained by the formation of their own

structures under the oceans, similar to the continents, only different, perhaps heavier.)

We think that the Moon did not form hills because the Moon has a very thick crust. It also seems to have a very small ball of magma inside, which contains the core. The Moon is much colder than the Earth.

The Sun exerts a stronger pull on the Earth than the Moon, but the Moon's pull has a greater gradient of force (the second derivative of the gravitational potential).

There is one more feature:

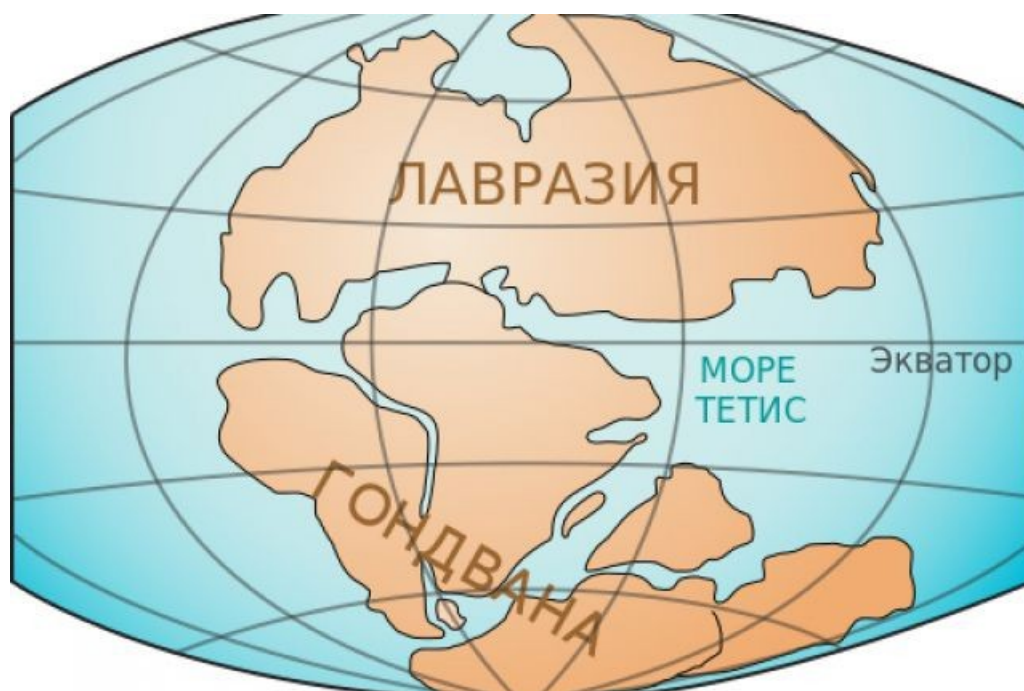
if you look closely at the continents, as they used to be, and before all the continents had to form a circle. And they form a crescent, even taking into account the recently discovered continent of "New Zealand". For a circle, there is still one more continent missing in the east, instead of the Tethys Sea.

Let's look! (The continent around Greenland has already been discovered.)

10/14/2023 read about the discovery of the continent of Pontus between Japan and New Zealand. It occupied a quarter of the Pacific Ocean.

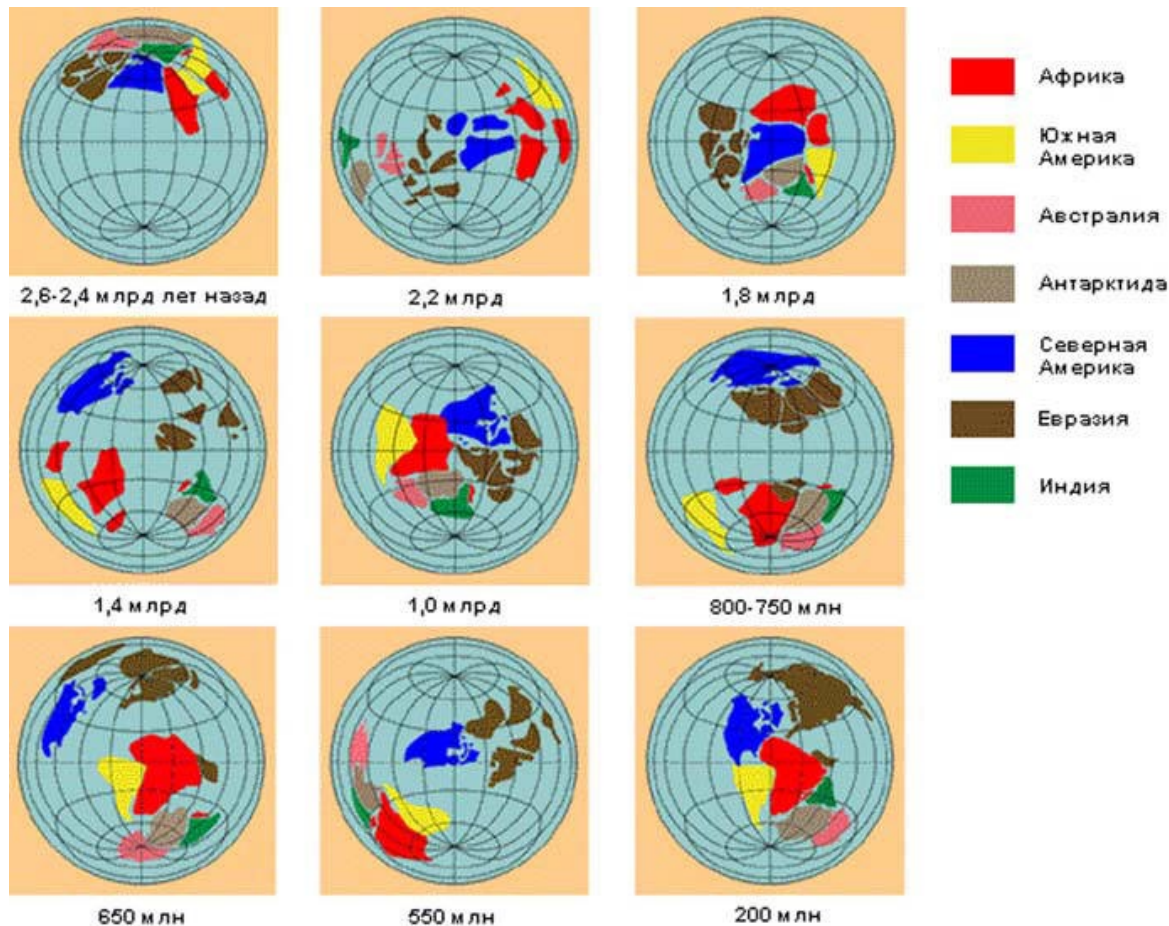
<https://lenta.ru/news/2023/10/11/plate/>

Or maybe the Moon was not in one point, but moved in the form of a crescent or in a circle, then instead of the Tethys Sea there would be no continent. Anything is possible.



I would like to take a closer look at another drawing:

On it,
the



continents sometimes converge, sometimes diverge. It looks like the Moon is sometimes approaching the Earth, sometimes moving away.

The idea was picked up by the masses:

<http://www.sciteclibrary.ru/cgi-bin/public/YaBB.pl?num=1504858840>

Серёга
Академик
★★★★★
 Отсутствует

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Гипотеза образования материков на Земле и морей на Луне.
08.09.2017 время 11:20:40

Луна и Земля по чуть-чуть разлетаются и затормаживают своё вращение. А несколько млрд лет назад Л и З были настолько близки, что вращение Земли равнялось периоду вращения Луны вокруг Земли. Л и З всегда были повернуты друг к другу одной стороной. Приливные силы Луны и подняли древний материк над морским дном, а приливные силы Земли образовали на видимой стороне Луны моря. Кстати, площадь материков приблизительно соответствует диску Луны. Или соответствовало раньше. Когда Луна отдалась, действие приливных сил упало, и единый материк стал раскалываться.

Всем счастья и здоровья!

Печать

ВИТАЛИЙ ТРУБИН
Академик
★★★★★
 Отсутствует

Сообщений: 284
Зарегистрирован:
12.01.2020
Пол: ♂

Re: Гипотеза образования материков на Земле и морей на Луне.

Reply #3 - 15.03.2020 время 06:08:28

Серге.

Это что все??? Супер краткое изложение тезисов??? Хотя на ум пришла поговорка или пословица: Краткость, сестра таланта.
У геологов и философов, это был бы трактат на полсотню страниц или больше.
Один детский вопрос: У нас образовались горы, а почему на луне тоже не образовались горы, а моря. Механика то одна по идее.

And published an article:

<http://www.sciteclibrary.ru/cgi-bin/public/YaBB.pl?num=1584259720>

Friends, use ideas, but in a general, conscientious manner. In general, according to conscience.

If the distance from the Earth to the Moon is now 380 thousand km, and the rotation of L around Z is 28 days, then according to Kepler's Law, for the rotation to be 1 day (24 hours) the distance must be 41 thousand km. Z-L have a mass ratio of 81:1, therefore $1/82$ (the distance from the Center of Mass of Z-L to the Geometric Center of the Earth) $41/82 = 500$ km. So if the Center of the Earth was shifted by 500 km, couldn't the surface of the Earth have risen by 2 km?

When the Moon moved away and the Earth's Core returned to the Geometric Center of the Earth, the Continent of India was "jerked" away from Africa to the North.

(Under the Indian Ocean was the Earth's Core.) And the Moon could also block the Common Continent from the Sun.

By the way, water was also collected above the Common Continent. It seems that it was the water that formed the traces of the Tethys Sea.

Calculation of the energy of the Moon's influence on the Earth.

Work is equal to force per distance. And power per time. Taking the force of attraction of the Moon to the Earth's radius approximately, we get 10^{27} J, which is a million times greater than the influence of atmospheric phenomena for the same 7 days, namely 10^{15} W * 7 days = 10^{21} J. Yes, this is clear, no cyclone will raise the earth's crust by 30 cm, like the Moon, or 10 cm, like the Sun.

1. 2. Traces of Theia, the planet that fell to Earth and formed the Moon, have been discovered.

Traces of the planet Theia have been found under the continents. This could have caused the formation of the continents themselves and their constant floating on the surface of the magma.

In the case of Theia falling and being absorbed by the Earth, the Moon would not need to be very close to the Earth to form continents. It is quite possible that in this case, the Moon would not be needed at all to form continents.

But the Moon is needed for the movement of the continents. Just as its approach and departure is needed to explain the periodic convergence and divergence of the continents.

Also, in the case of Theia, the original continent could have been in the form of a ring, and not a solid disk.

Under gravity, there are stable positions of three bodies in the form of a regular triangle. If we take the Sun and the Earth as the basis of such a triangle, then there will be 2 such regular triangles. I assume that the Moon was born in one external vertex, and Theia in the other. Theia fell to the Earth, and the Moon began to rotate around the Earth. This can explain all the observed facts.

1.3. There are other people with the same ideas.

On the site "New Theory" I recently found a message from December 19, 2011 by Viktor Yanovich with the same ideas about the movement of the Earth's continents under the influence of the Moon. Here is the link:

<http://www.newtheory.ru/astronomy/o-prichine-dreyfa-materikov-t1513.html>

I put forward my hypothesis in 2015. I read Viktor Yanovich's ideas after I came up with the hypothesis and only on May 19, 2024.

2. Planets and Asteroid Belts.

Sha S.V.

2.1. Titius-Bode rule.

Sha S.V.

The Titius-Bode rule, which describes the regularity of the radii of planetary orbits, can be found on Wikipedia.ru:

[https://ru.wikipedia.org/wiki/Rule_Titius — Bode](https://ru.wikipedia.org/wiki/Rule_Titius_%20Bode)

In general, it states a geometric progression plus a constant for the radii of the planets' orbits.

Theoretical justification (Sha S.V.).

Let us assume that the planets were formed from a gas-dust nebula with boulders around a single Star. For simplicity, we will assume that the nebula is flat with a constant thickness $h = \text{const}$. The planets will fly in circular orbits. They are formed from the rings of the nebula with an inner radius R_{int} and an outer radius R_{ext} . For simplicity, we will call the next planet Earth. The conditional radius of the born planet will be denoted by $r_{\text{земл}}$. The density of the nebula $\rho_{\text{тум}}$ and planets $\rho_{\text{земл}}$ is constant.

Let's introduce the coefficient k : $R_{\text{внеш}} = k \cdot R_{\text{внутр}}$.

law. $\frac{R^3}{T^2} = \text{const}$, $T = \frac{2\pi R}{V}$, where R is the radius, T is the period of rotation and V is the speed of rotation. The same law through R and V

$$R V^2 = \text{const}$$

Equality of masses of the nebula ring and the Earth.

$\rho_{\text{тум}} \pi (k^2 - 1) R_{\text{внутр}}^2 h = \rho_{\text{земл}} \frac{4\pi}{3} r_{\text{земл}}^3$, Briefly speaking

$$r_{\text{земл}} = \text{const} \sqrt[3]{(k^2 - 1) R_{\text{внутр}}^2}$$

Poincaré-Cartan integral invariant.

In Wikipedia.ru [Poincaré-Cartana Integral](#) for closed loop C :

$\oint_C \left(\sum_i m_i v_i dx_i - H dt \right) = \text{const}$ We will take a cycle at time $t = \text{const}$ ($dt=0$), particle

masses $m_i = \text{const}$ and cycle C , passing external, internal and radially from external to internal radius and back. This is on the one hand, and on the other for the Earth along the external radius. This is a simplification, whoever wants can take integrals over the entire volume of the ring and the sphere of the Earth, dividing them into cycles and integrating in the form $\int \oint \dots$ Personally, this is enough for me.

Taking into account Kepler for the nebula ring and the radius of the earth and the corresponding velocities, we obtain:

$$\oint_C \left(\sum_i m v_i dx_i \right) = 2\pi m (R_{\text{внеш}} V_{\text{внеш}} - R_{\text{внутр}} V_{\text{внутр}}) = \text{const} (\sqrt{k} - 1) \sqrt{R_{\text{внутр}}}$$

==

$$\text{const} V_{\text{земл}} r_{\text{земл}} = \text{const} \sqrt{r_{\text{земл}}}$$

$$r_{\text{земл}} = \text{const} (\sqrt{k} - 1)^2 R_{\text{внутр}} \cdot$$

Let us equate the radii of the Earth obtained from the conservation of mass and the Poincaré Integral, and we obtain an expression for the inner radius of the nebula ring:

$$R_{\text{внутр}} = \text{const} \frac{k^2 - 1}{(\sqrt{k} - 1)^6} \cdot$$

There are 3 variables and 2 equations, so let's add one more equation.

The planet is not quite a planet yet, but a protoplanetary cloud. And its radius should be half the width of the ring, that is:

$$r_{земл} = \frac{(k-1)}{2} R_{\text{облач}}.$$

This system will always have a solution for k .

Anyone who wants can calculate more precisely. Either for variable thicknesses of the nebula, or from variable densities, etc.

By equating the outer radii of the rings of some rings to the inner radii of others, we obtain a geometric progression plus a constant.

This is all well and good, but where in the nebula ring is the planet itself located?

Kepler claims that $V^2 R = C_o^2 = const$.

The mass of the planet is equal to the mass of the nebula ring

$$M_{пл} = \rho_{\text{мгм}} \pi (k^2 - 1) R_{\text{облач}}^2 h$$

And the sum of the impulses of the thin subrings of the nebula before the birth of the planet should be equal to the impulse of the planet.

The momentum of the ring is equal to the momentum of a planet with orbital radius R .

Then

$$\int_{R_{\text{облач}}}^{k R_{\text{облач}}} p dR = \int_{R_{\text{облач}}}^{k R_{\text{облач}}} 2 \pi h \rho_{\text{мгм}} C_o R^{1/2} dR = \frac{4}{3} \pi h \rho_{\text{мгм}} C_o (k^{3/2} - 1) R_{\text{облач}}^{3/2}$$

==

$$M_{пл} V_{пл} = \rho_{\text{мгм}} \pi (k^2 - 1) R_{\text{облач}}^2 h C_o R^{-1/2}$$

We obtain the radius of the planet R relative to the inner radius of the nebula ring R_{int} :

$$R = \left(\frac{3}{4} \cdot \frac{k^2 - 1}{k^{3/2} - 1} \right)^2 R_{\text{облач}}$$

Result : We obtained a constant coefficient k of dependence of the position of the planet relative to the inner radius of the ring from which this planet is formed.

Let a_i will be the distance between the outer radius of the $(i-1)$ -th planet and the inner radius of the i -th planet. A b_i expresses the dependence of k on the density and thickness of the i -th ring of the protoplanetary disk.

Then the general expression for the radius of the i -th planet :

$$R_i = a_i + b_i k R_{i-1}$$

If the density and thickness of the protoplanetary disk are constant, $b_i = 1$.

And at zero distances between the rings of the protoplanetary disk $a_i = 0$. We obtain $R_i = A + B k^i$. This is the Titius-Bode relationship.

2.2. Asteroid belts.

Sha S.V.

In the Solar system, first come the 4 light planets, then the fifth is the asteroid belt. Then come the 4 heavy planets, for which the 4 light ones can be ignored, and again the asteroid belt.

(Then there are 4 planets and a belt, whose plane of rotation is very different from the previous planets. And then, it seems, there will be 4 planets and a belt that will rotate in the opposite direction. But this is only a hypothesis. And most likely, the 4th five (4 planets and the asteroid belt) will be super-giants, and only the 5th five will rotate in the opposite direction.)

A pattern can be traced: 4 point objects are formed from a gas-dust nebula, but the 5th fails to form.

The same is true in mathematics: equations up to the 4th degree can be expressed through their coefficients in analytic functions, but those with 5th and higher degrees cannot.

About the explanation of this m o g l o would be absence what 's wrong decisions models gas - dust concentrations fog for the 5th object .

Let's analyze!

There is a more or less constant coefficient k , connecting the outer and inner radii of the nebula ring, which first forms a protoplanetary object and then a planet. The outer radius of one ring may not coincide with the inner radius of the next. Also, k can change due to various reasons .

Planets and protoplanetary objects can be affected by a variety of factors. Taking this into account, we must look for stable solutions of the characteristic equation of the i - th degree for the i -th planet :

$$a_i k^i + a_{i-1} k^{i-1} + \dots + a_1 k + a_0 = 0.$$

Polynomials up to 4th degree are solved. And the solutions are analytical and smooth.

But at the 5th degree there are no solutions. Everything can happen unpredictably there.

Therefore, instead of the 5th planet, an asteroid belt will form. Although the 5th planet could have originated, the constant cat-vasiya would have destroyed the protoplanetary cloud.

With Jupiter and beyond, the giant planets, I have already given explanations above.

It seems that the rule also applies to the satellites of the planets. There are also several satellites, and then rings, like Saturn and Jupiter. The reasons are the same.

And now they have started to discover planets beyond the second asteroid belt. They are not in the plane of the nearby planets. This explains why the previous planets do not particularly affect them. And it looks like the asteroid belt will come after the four planets again.

It can be assumed that beyond the third four planets + belt, in the case of non-standard characteristics of the protoplanetary cloud, there may be more planets. Since the characteristic polynomial in them contains different k .

Why can't planetary systems do without asteroid belts? Why, after the 4 small terrestrial planets, shouldn't Jupiter and its group of 4 giant planets be in 5th place?

Probably, being in 5th place, Jupiter would have destroyed the entire first group of terrestrial planets, but the asteroid belt smooths out the influence of the giant planets on the first 4.

2.3. Earth-Moon connection.

Sha S.V.

I think there are two plausible options for the formation of the double planet Earth-Moon.

1) In the gravitational field there is a solution for three points in the form of a regular triangle. The Sun-Earth-Moon form this triangle. After which the Earth and the Moon could unite.

2) During condensation from a gas-dust nebula, an object with a very large rotation moment could have appeared. This moment could have been optimized into 2 connected points. These are the Earth and the Moon. To prevent a single

planet from rotating too quickly, part of the moment went to the moment of the Moon's rotation around the Earth.

The absence of duality in Mercury and Venus is explained by the proximity of the Sun and the small thickness of the protoplanetary rings. And in Mars, by the proximity of Jupiter. The Earth is far from both the Sun and Jupiter. And besides, the thickness of the Earth's protoplanetary ring is quite large, and the moment of rotation is large.

3) A residual disk from the planet Theia that fell to Earth has been discovered. It should have given birth to the Moon, so it is quite possible that the Earth-Moon connection is a random phenomenon.

3. Dark matter and dark energy.

Sha S.V.

There are huge radiations and gravitational forces in the center of the galaxy. They break atoms into electrons and protons. It follows from the law of conservation of momentum that lighter electrons gain greater speed, and gravitational forces slow down both protons and electrons equally. (They have the same braking acceleration.) Therefore, faster stopping protons remain in the center of the galaxy, and electrons fly to the periphery. It turns out that the center of the galaxy is positively charged, and the outskirts are negatively charged. An electric force of attraction arises between them. This can explain the effect of dark matter.

And dark energy in this case is explained by streams of negatively charged particles that fly out of galaxies. They push them apart.

This idea was born when they said that the Voyager spacecrafts accelerated due to ionization at the edge of the Solar System. True, later this was explained by the activity of internal nuclear reactors. But the idea was born.

Hooray! CalTech confirmed this for protoplanetary disks:

<https://lenta.ru/news/2022/07/07/disc/>

True, CalTech also took into account the magnetic repulsion of opposite currents. Protons and electrons move in one direction, but charges move in opposite directions.

4. Turbulence mechanism

Sha S.V.

Turbulence occurs in several stages:

1- The flow density becomes wavy. The front particles are slowed down by

resistance or accelerated by the attraction of the stationary medium. The rear particles of the flow hit the slowed front particles or start to lag behind the accelerated front particles and stick to the following ones. Thus, the homogeneous flow begins to undulate.

2- A part of the front flow or the middle flow with increased density begins to turn away from the main flow. This is caused by the pressure difference in the jet and the external environment.

3- The flow that has turned away draws in the minimum density of the agitated main flow. And it forms a vortex. The vortex twists and breaks away from the main flow.

This qualitative description of the turbulence mechanism is valid for all cases. The specific mathematics depends on the substance: be it gas, liquid, superfluid or superconductors.

Physicists have directly seen electron vortices

<https://nplus1.ru/news/2022/07/06/electron-vortices>

Everything is confirmed in detail in “Technology for Youth” No. 1 for 2022.

By the way, in the derivation of the Gibbs distribution in "OTF - General Theory of Physics" there was a mention that the solution of the equation at a very small α generates the Gibbs distribution. It should only be noted that a wave does appear there at high speeds. This should also generate turbulence even for an ideal medium.

5. About ether, Higgs and torsions.

Sha S.V.

About the air.

Ether is good for explaining the independence of the speed of light from the source, but is not at all suitable for describing the independence of the speed of light from the receiver. Therefore, there is no ether.

And also, if there is ether, then when particles are formed from it, the Second Law of Thermodynamics is violated. Order increases and entropy decreases. Which should not be.

Moreover, if you consider the ether, you will find that there was no Big Bang and the Universe existed forever.

About the Higgs field.

The Higgs field is a new kind of ether with Einsteinian properties. And although Higgs was found, most likely there is no omnipresent scalar Higgs field. Instead, it is better to look for causes inside elementary particles, and not to endow the vacuum with this property.

About torsion theories.

They are good in a flat section, but are completely unsuitable for three-dimensional spaces. They do not create circular fields, which is the case with the electric field of particles. In addition, if one of several torsions is turned 180 degrees, then its action will change to the opposite, which is not the case with elementary particles.

Thus, if the torsion describes an electric charge, then it changes the sign of the charge when turning 180 degrees. And if it is spin, then when turning 360 degrees, the spin returns to its place, and should go to the opposite. Only 2 full turns should return it to its place.

6. Matter and Antimatter. Higgs and Antihiggs.

Sha S.V.

Higgs Lagrangian:

$$L_{higgs} = (D_\mu \varphi)^\dagger (D^\mu \varphi) + m \varphi^\dagger \varphi - \lambda (\varphi^\dagger \varphi)^2$$

where φ is the Higgs field.

The Higgs field is always present in a square, and the Higgs boson mass is given by the last two terms. So one could assume that the Higgs mass could be either positive or negative. This would introduce antimatter.

1. For positive mass

$$\text{Lagrangian}(m+) = \text{Kinetic energy}(m+) - \text{Potential energy}(m+).$$

$$\text{Total energy}(m+) = \text{Kinetic energy}(m+) + \text{Potential energy}(m+).$$

2. For a negative mass, we get

$$\text{Lagrangian}(m-) = \text{Kinetic energy}(m-) - \text{Potential}(m-) =$$

$$= - \text{Kinetic energy}(m+) - \text{Potential}(m+) =$$

$$= - \text{Total energy}(m+).$$

Since matter conserves its total energy, antimatter must have a constant Lagrangian. Therefore, there is no principle of least action for antimatter. It has no specific trajectory. All trajectories are equal for it. It does whatever it wants.

$$\begin{aligned} \text{Total energy (m-)} &= \text{Kinetic energy (m-)} + \text{Potential energy (m-)} = \\ &= - \text{Kinetic energy(m +)} + \text{Potential(m +)} = \\ &= - \text{Lagrangian(m +)}. \end{aligned}$$

That is, the total energy of antimatter is minus the Lagrangian of matter. That is, it must be extreme.

Thus, antimatter either runs wildly or remains permanently motionless.

Conclusion: the presented hypothesis explains the difference in the behavior of matter and antimatter. And explains why matter formed the Universe, and antimatter "disappeared".

7. A PERPETUAL MOTOR has been created!

Sha S.V.

The entire Universe is a perpetual motion machine! Without it, there is no time. Therefore, it is eternal in the truest sense of the word.

I won't patent it! Feel free to use it, anyone!
Ha-ha-ha!

7.2. Impossibility of a Perpetual Motion Machine.

Sha S.V.

A perpetual motion machine must transform potential energy into kinetic energy. But any potential energy is ultimately kinetic. And kinetic energy is not infinite. Therefore, it is impossible to create a perpetual motion machine.

There is no potential energy in nature. It's a mathematical trick.
But something must act as potential energy?
Only a material body. And it can act only by kinetics.

On the other hand, if a perpetual motion machine were possible, the universe would have overheated and died long ago.

8. On the properties of particles

Sha S.V.

8.1 Why are all electrons the same?

And not only electrons, but also protons, neutrons, muons, etc.
Probably because they are made up of identical subparticles at a deeper level. For example, quarks. And those in turn are made up of identical, even smaller particles.

But all this is not an explanation. It is useless to explain the sameness of the whole through the sameness of its parts.

Most likely, we need to reach a level where the particle itself and its field are formed by the same components (subparticles). It would seem that these subparticles do not have to be all the same, but their interaction should lead to the formation of both the particle and the field surrounding it. They must be united.

Then everything depends on the specific mechanism. Either it will be a negative feedback, or a positive feedback, generating resonance with nonlinear effects. With negative feedback, very large losses are obtained, so this is unlikely.

In general, science has yet to reach those levels.

Science still has to study not only the structure of elementary particles, but also the structure of the field.

Good luck to you, friends!

It seems that electrons are formed through a positive feedback mechanism, and hadrons through a negative one. (Or maybe the other way around. Everything can be explained in words.) Therefore, they are the same in terms of the number of structural elements (the number of quarks and leptons is the same), but they differ greatly in mass. Positive feedback requires fewer subparticles and energy.

The question remains: why do the charges of protons and electrons coincide in magnitude? This can be explained by the fact that virtual photons are born at a certain geometric curvature of the field, that is, at the same distance from the center of the particle. The sign is determined by the direction of rotation of the subparticles.

8.2 Why do all electrons move?

All particles move, but why? If they consist of subparticles, why don't they rest? It seems because the subparticles interact with themselves. Such a subparticle flies out, makes a circle, and after some time returns and interacts with its trace. This is what generates the constant movement of particles.

9. Fermat's Last Theorem.

Sha S.V.

The FLT has two non-standard solutions: 1 - when one of the terms is 0, and 2 - when there are terms with infinity.

To prove the FLT, you need to indicate how to exclude these two solutions. When they are excluded not in words, but in fact, then the solution will be found.

For example, one can use torsions and pseudo-Euclidean fields.

10. Discreteness of space and/or time.

Sha S.V.

If only time is discrete, then you can choose the speed and initial position so that at some point you are in front of the wall, and after a discrete interval you will be behind the wall. You will not collide with the wall. I hope this is clear? Let me clarify, a person will be inside the wall when continuous time will show a fractional part of the minimum time interval in discrete time. And since time is discrete, it has no fractional part. Therefore, there is no event of a collision with the wall.

So you can go through any wall. This is the case (with a wall) for discrete time and continuous space

And if both space and time are discrete for you, then another question: how do you imagine a jump at the smallest step during the smallest interval of time?

The ancient Greeks discussed all this. Remember the paradox of Achilles and the Tortoise. It was invented precisely because of discreteness. If we live in a discrete world, then Achilles may not catch up with the tortoise. The sum of the terms of the geometric progression of the reduction of the distance between Achilles and the Tortoise (in discrete space) diverges. The step does not tend to zero, but is limited from below by a minimum value greater than zero (zero is obtained in continuous space).

Theorem:

In discrete space-time, all distances and speeds are equal to 0!!!

Proof:

In discrete space-time, there is a minimum distance (A) and a min. time (T). Consider the paradox of Achilles and the Tortoise.

1) Let the distance between Achilles and the Tortoise have already reached A and the time T. And if any distances are not equal to 0, then while Achilles runs A in T, the Tortoise will also overcome A in T. The Tortoise cannot crawl in a time less than T. This means that Achilles will always be at a distance A in T from the Tortoise.

2) On the other hand, one can always calculate the difference in the speeds of Achilles and the Tortoise and get the time when Achilles overtakes the Tortoise even in the discrete case.

1) and 2) contradict each other. This means that all distances are equal to 0, and therefore the speeds are equal to 0.

Which is what was to be proved!

Therefore, there is no such thing as discrete space or time!!!

I repeat a simplified version of the theorem.

1) Let us assume discreteness of space and time.

2) Let's assume that there is a non-zero distance and duration.

3) We decrease them until they become less than the discreteness step.

4) And then we get:

4.1) Either the difference between distance and time is equal to the discrete step and Achilles will never catch up with the Tortoise, which is not so!

4.2) During the discrete step, Achilles and the Tortoise do not move at all. This means that nothing moves in discrete space and time.

11. Gibbs paradox.

Sha S.V.

"Usually the exit from a dead end is the same as the entrance"
folk wisdom :)

Description of the paradox on Wikipedia:

https://ru.wikipedia.org/wiki/Gibbs_Paradox

The entropy of an ideal gas is expressed by the formula:

$$S = N C_v \ln(T) + k N \ln\left(\frac{V}{N}\right) \quad (1),$$

Where

S – entropy,

N is the number of particles,

C_v - heat capacity at constant volume,

T – temperature,

k — Boltzmann constant ,

V – volume.

Two identical volumes of gases with identical T and N are considered, with a partition between them. The partition is removed. In the first case, two identical gases are mixed ; in the second, two almost indistinguishable different gases . The resulting entropies have a difference of $2 k N \ln(2)$ (2).

There is no difference in experiments!

We will look for the way out of this impasse in the same place where we found the entrance. Namely, in formula (1).

Note that the mean free path of particles is:

$$L = \frac{1}{\sqrt{2} \sigma \frac{N}{V}} \quad (3),$$

Where

L is the mean free path of particles ,

σ is the cross-sectional area of one particle.

Then formula (1) is transformed to the form:

$$S = N C_v \ln(T) + k N \ln(\sqrt{2} \sigma L) \quad (4).$$

Cross-sectional area (σ) is almost equal for similar particles.

And the length of the free path (L) is determined by both collisions of identical and different particles, therefore, with the same quantities of all particles and the same occupied volumes, it does not change. Consequently , the entropies of these gases behave identically.

THERE IS NO MORE GIBBS PARADOX!

The obtained formula can be checked as follows:

make the distance between the upper and lower walls of the vessels less than the mean free path at a constant volume , then nothing will change for Gibbs and Quantum Mechanics, and according to my formula the temperature will drop, since the entropy will not change, the second term ($k N \ln(\sqrt{2} \sigma L)$) will increase due to the fact that σ will become equal to the total area of the upper or lower surface of the vessel; therefore, the first ($N C_v \ln(T)$) will decrease . By the way, this is what is done when cooling gases. They are driven through long and thin pores.

12. Problems of Information Theory with the Gibbs paradox.

Sha S.V.

The presence of the Gibbs paradox in Thermodynamics automatically transfers this paradox to Information Theory (IT) since the information formula is the second term of entropy in Thermodynamics taken with the opposite sign.

The entropy of an ideal gas is expressed by the formula:

$$S = N C_v \ln(T) + k N \ln\left(\frac{V}{N}\right),$$

Where

S – entropy,

N is the number of particles,

C_v - heat capacity at constant volume,

T – temperature,

k — Boltzmann constant ,
 V – volume.

Let me explain it in simple terms.

1. Entropy = -Information.
2. Since the Entropy formula has the Gibbs paradox, Information has it too.
3. The experiment shows that Entropy does not have the Gibbs paradox.
4. But the Dumb Information Theory still has it.
5. Therefore, Entropy is NOT equal to -Information, which contradicts point 1.
6. Therefore, Information Theory is sheer stupidity.

Which is what had to be proven!

Therefore, either we need to add a term to the Information Theory formula, as Gibbs added to explain his paradox. He took into account the interchangeability of identical particles (they also do this in quantum mechanics), which would violate the concept of information and information would be able to increase or decrease; or, in general, we need to recognize Information Theory as an approximate science.

Information Theory also has problems with the dialectical law “on the transition from quantity to quality.”

13. Dark matter.

Sha S.V.

Recently, a 750 GeV particle was almost discovered at the LHC. They reached 3-sigma (5-sigma is needed). But then, at those energies of colliding proton beams, the experiments were stopped and they began to check at higher energies, and the particle was not confirmed.

What if this particle is registered only at the initial energies? It is not for nothing that dark matter is so elusive. A lot

could be explained with this particle . In particular, the mass of dark matter is approximately 6 times greater than usual, and the mass of a 750 GeV particle is 6 times greater than the Higgs boson 125 GeV.

If only we could return to the old energies and collect more complete statistics!

14. Soliton.

Sha S.V.

Solitons were discovered on a canal in England. When a boat stopped quickly, a single ridge would break off and float for a long time on the water.

Such phenomena were called Solitons and they tried to describe them with differential equations with differentials of the 1st and 0th degree. Some things were explained, and some were not.

Let's think logically.

Is it significant that Soliton was floating along the channel? It is quite possible that some sound waves are scattered across the water from Soliton. Then they are reflected from the walls of the channel and thus some of the waves hit Soliton itself.

This can be described as an integral of such waves. A differential equation of a higher degree is obtained. And such equations have a resonance. Which, most likely, explains Soliton.

If Ball Lightning has the nature of a Soliton, then interaction with external objects through waves in the atmosphere explains their adhesion to poles and trees, their parallel movement along electrical cables and transport, and much more.

15. High-temperature superconductivity .

Sha S.V.

High-temperature superconductivity was discovered in ceramics. It has layers that conduct current. At high temperatures, due to the different expansion coefficients of the base material and the layer, a lot of pressure is created in the layer itself. And the higher the pressure, the higher the temperature at which superconductivity occurs.

And even better, the superconducting current itself would cause a pressure difference between the interlayer and the main substance. This would result in a specific "Superconductivity Laser".

(It turns out that with increasing pressure the critical temperature of superconductivity increases, a known fact. And I thought it was unknown.

<https://nkj.ru/open/42373/>)

16. Black holes must eject internal matter .

Sha S.V.

At the center of the galaxy is a black hole. The mass of this BH is much less than the mass of the galaxy. Star arms emanate from the central BH. Usually 2

from the poles of the BH. If stars were formed in these arms, which in turn would be accelerated remnants of matter attracted by the BH, then the galaxies would be much lighter than the central BH.

Therefore, black holes must eject internal matter from themselves at the poles. This internal matter seems to consist of smaller elementary particles than is currently known. Globular galaxies may be the result of explosions of central black holes.

17. Time, Space, Matter.

Sha S.V.

Time is what separates and unites cause and effect.

Cause first, effect later.

So! At the same time, it should work not only in one direction, but in such a way that by the Consequence it would be possible to find the Cause and Error of random events.

It would be possible to move on to mathematics, but in mathematics only logic touches upon Causes and Effects. In logic itself there is one nuance: there, both Falsehood and Truth can follow from Lie. It is not yet clear how to deal with this. It is necessary to develop another section of formal Logic (a section of mathematics), and then clothe it in formulas.

The power of such a definition is in Mathematicality!

The justification for the unidirectionality of time is determined precisely by Cause-Effect. Many do this through the non-decrease of entropy, but this is indirect. The 2nd Law of Thermodynamics is obtained from the GTF equation

$$\text{(Gibbs distribution)} \quad \frac{\partial f}{\partial |\vec{v}|} \cdot \frac{3}{|\vec{v}|} + \alpha f = 0.$$

The reason is there $f(\alpha_1) + f(\alpha_2)$,

and Investigation $2f\left(\frac{\alpha_1 + \alpha_2}{2}\right)$.

Where α_i is inversely proportional to temperature and behaves correctly when, during interaction, the hot can only cool down, and the cold can only heat up. But this is a statistical rule, like the temperature itself.

Many consider Time as Space, as the 4th axis, but this is refuted by the case when at one point there are two bodies with different speeds. Time at this point will flow differently for different bodies. And therefore, it is impossible to consider Time as Space or as an axis.

Space is what separates and unites two objects.

Matter is what is separated and united by Space and Time. Everything depends on what we take as the primary causes.

I can't give more precise definitions yet. :-)

18. Dark matter and lensing in colliding galaxies (according to Einstein).

Sha S.V.

1) Gravity is obtained from the non-uniformity of the interaction force of the El-Mag fields at + + and + -. See "Fields and Particles". But for this to happen, the El-Mag fields from + + and + - must not cancel each other out, but exist simultaneously.

2) When galaxies collide, this El-Magn field flies out by inertia beyond the galaxies and is visible in the form of Einstein Lenses.

This is not Dark Matter.

19. The Big Bang .

Sha S.V.

It seems it didn't happen. The Universe was shrinking to a Point, but before it reached it, it turned back. So there was no Hyper-Inflation. All these Explosions and Collapses lead to a very large loss of matter. This shouldn't happen.

Only man is capable of surpassing the speed of light; no inanimate matter can.

20. Chaos = Reality - Information .

Sha S.V.

In the whole body there is both order (information) and chaos. This can be written as:

Chaos is Reality without Information about the system.

21. The birth of EVERYTHING.

Sha S.V.

for the birth of Everything .

1st) the basis of everything is space and it gives birth to matter.

Or 2nd) the basis of everything is matter and it gave birth to space.

For me the 1st option is more obvious. So Matter is a curvature of space. There are many ways further, but it is obvious that the curvature is caused by time. There is nothing else. And it means that space is not uniform. And the movement of non-uniform space gives birth to curvature, and therefore, matter.

22. The Liar paradox generates a topology of boundaries.

Sha S.V.

" All Cretans are liars," said the Cretan.

This is a paradox. The essence is $\mathbf{A} = \sim\mathbf{A}$.

It has been refuted for a long time. And this is a negative action. It is better to make it generate something useful. Then it will be positive.

Let's try! Let A be a region of truth, and its boundary is not quite truth. And $\sim\mathbf{A}$ is another region, a region of lies, with a boundary of not quite lies. Then $\mathbf{A} = \sim\mathbf{A}$ generates this very boundary. It's quite topological!

Approaches to the Liar's paradox can also justify fuzzy logic, but there the entire mathematical apparatus is reduced to probability theory. And here to topology. And it also highlights the boundaries of objects! Hurray!

Algorithm for selecting a boundary:

1) assign 1 to the points where True; -1 to the points where False; 0 to the rest.

2) each point is assigned the average of the neighboring points. Where it turns out to be neither -1 nor 1, we assign 0.

3) according to the rule $\mathbf{A} = \sim\mathbf{A}$ we select the border. That is, the points from 0.

That's all!

Or you can act non-isomorphically and assign 0 to Truth and Falsehood, and 1 to undefined. Then $\mathbf{A} = \sim\mathbf{A}$ will select all defined values.

23. Three-dimensional photograph (I took the photo myself).

Sha S.V.

Well, how do you like it? And no tricks.



24. The need for Einstein's STR.

Sha S.V.

Showed the need for a service station. They even called me "A ray of light in a dark kingdom".

Серёга
Экс-Участник

Re: ОТФ - Общая Теория Физики
Ответ #55 - 07.09.21 :: 13:31:06

Выделить & Цитировать Цитировать

Крюков, успокойся! СТО всем нужна. А твоё опровержение никому.

Ты же пойми простую вещь. Если бы не было ограничения по скорости света, любая катастрофа во Вселенной моментально бы нас накрывала бы. И только эта ограниченность в скорости нас бережёт.

Всё в СТО верно. Формулы-то там до А.Эйнштейна открыли. И решили, что все они - свойство эфира. Но эфир получался противоречивым. Поэтому его с радостью откинули все.

« Последняя редакция: 07.09.21 :: 19:16:02 от Н/Д »

IP записан

Наверх

SP
Ветеран форума

Re: ОТФ - Общая Теория Физики
Ответ #56 - 07.09.21 :: 17:10:07

Выделить & Цитировать Цитировать

SP
Ветеран форума
☆☆☆
Вне Форума
участник форума
Сообщений: 3821

Re: ОТФ - Общая Теория Физики
Ответ #56 - 07.09.21 :: 17:10:07

Выделить & Цитировать Цитировать

Цитата:

Крюков, успокойся! СТО всем нужна. А твоё опровержение никому.

Ты же пойми простую вещь. Если бы не было ограничения по скорости света, любая катастрофа во Вселенной моментально бы нас накрывала бы. И только эта ограниченность в скорости нас бережёт.

Всё в СТО верно. Формулы-то там до А.Эйнштейна открыли. И решили, что все они - свойство эфира. Но эфир получался противоречивым. Поэтому его с радостью откинули все.

вот лучь света в тёмном царстве!

(СТО подтверждена гоняниями СТОПИЦОТ ускоренных частиц на тысячах ускорителей

)

25. Thermonuclear power plants.

Sha S.V.

Russian physicists have compacted a plasma clot by 1.5 times, and reduced the emission of particles by 10 times. They have organized a helical magnetic field around the plasmoid. Here is the article:

<https://nplus1.ru/news/2023/02/04/SMOLA>

We must continue! To do this, organize a stream of neutrons and protons inside the clot in the opposite direction to the magnetic field. This will create a

kind of torsion. This will plug the loss of particles, and on the other hand, ensure the removal of the resulting heat.

26. Fine Structure Constant.

Sha S.V.

Alexander Rybnikov pulled the function out of thin air $\int e^{-x^2} dx$ and got the PTS by comparing the first extremes. Well done. The coefficients are omitted in the function.

http://www.sciteclibrary.ru/yabb26/Attachments/S_S_S_R_002.pdf

And I got a function e^{-v^2} . You can also play around and get a PTS. Only I didn't take the function out of thin air, but got it in "OTF - General Theory of Physics".

27. The dipole must radiate electromagnetic waves along the axis. Possibly longitudinal ones.

Sha S.V.

Alexander Rybnikov claims that the dipole emits EM waves along the axis, and that no one can describe it. And what is there to describe? I found 3 cases:

1) The dipole's center of mass is stationary, and the charges oscillate along the axis in antiphase. The dipole's arm is variable. This generates EM radiation.

2) The dipole arm is constant, and the entire dipole oscillates along the axis. This also generates EM radiation.

3) The dipole arm is constant, and the charges rotate in opposite directions.

It is even possible that these radiations are longitudinal. And it is also possible that at a large distance they decrease very quickly.

The people supported:

<http://www.sciteclibrary.ru/cgi-bin/yabb2/YaBB.pl?num=1677411560>

Михаил Анатольевич
Частый участник форума
☆☆☆
Вне Форума

Сообщений: 344

Re: Продольные радиоволны
Ответ #12 - 29.06.23 :: 20:00:05

Vallav писал(а) 27.06.23 :: 16:55:21:

Вдоль оси? Что за параметры у него, которые сосредоточены?

Берём диполь, да непростой. Это диэлектрическая палка, а на концах куски металла. Расстояние между кусками металла аккурат равно полволны в воде... Подаём сигнал от передатчика... Наблюдаем излучение вдоль оси диполя.

Такие антенны были нами применены в экспериментах 2017-2018 годов. В качестве электродов применялись металлические пластины. Это была медь, алюминий, цинкованное железо. По обстоятельствам. Работали на частоте 27 мегагерц. Наблюдалась ясно выраженная диаграмма направленности. Вдоль оси сигнал больше, а поперёк оси меньше. Как работает такая антенна описано в работах ВАА. По результатам работ был выпущен отчёт Рогатка-2017.

« Последняя редакция: 29.06.23 :: 20:19:26 от Михаил Анатольевич »

Наверх IP записан

28. There must be a planet inside the Sun.

Sha S.V.

It seems that there is a planet inside the Sun ("Icarus"). Approaching the surface of the Sun, it concentrates magnetic fields on itself. And so dark spots are formed on the Sun.

And for the period of activity of spots to correspond to the periods of rotation of Jupiter and Saturn, there must be several inner planets. When Jupiter and Saturn are on the same axis with the Sun, the inner planets run together, and when Jupiter and Saturn are not on the same axis with the Sun, the inner planets run apart.

It seems that the spot on Jupiter can also be explained by Jupiter's inner satellite.

29. Inverse matrix.

Sha S.V. (autumn 1981)

A is a matrix. E is the identity matrix. R and C are a set of matrices for working with rows and columns. Then there are 3 algorithms for obtaining the inverse matrix to A.

1) If $RA=E$, then $RE=RAA^{-1}=A^{-1}$.

2) If $AC=E$, then $EC=A^{-1}AC=A^{-1}$.

3) If $RAC=E$, then $A=R^{-1}EC^{-1}$ and therefore, $A^{-1}=CER=ECR$. But we usually solve $AX=B$ as $X=A^{-1}B=(EC)(RB)$, and don't have to remember R.

30. New science of "Cause and Effect Relationships".

Sha S.V. (03.10.2023)

- That which participates in the Cause and only that which changes its (similar) characteristics in the Effect.

The characteristics change according to the following Rules:

Rules (axioms) of cause and effect:

- 1) From a true cause, a true consequence always follows.
- 2) If a false statement formally follows from a true reason, then it must be transformed into a true one.
- 3) Nothing follows from a false cause.

30.2. Let's check the liar paradox.

Let's check the liar paradox.

The Cretan said that all Cretans are liars. Let's accept this as the truth.

From it, according to 1), it follows that this Cretan is also a liar. Let's accept this as the truth.

And from this it follows that the expression "all Cretans are liars" is itself a lie. According to 2) it should be replaced with the truth. We get "not all Cretans are liars" or "Cretans do not always lie". This is the truth.

This solves the liar paradox.

This paradox generates from causes and effects some feedback that changes the cause. As in mechanics or radio electronics.

31. Hot things cool down in the refrigerator faster than cold things.

Sha S.V.

Hotter heats the air in the refrigerator more until the door is closed. When the door is closed and the air cools, a deeper vacuum is created. And the stronger the vacuum, the faster the liquids evaporate, which quickly cools the food. Therefore, hot food cools faster than cool food.

Everything should be explained by the operation of the refrigerator's automatic system.

32. The glowing train and the dark tunnel - is this a paradox of the Special Theory of Relativity?

Sha S.V.

The example of a train and a tunnel is often given: when a train moves and shortens, it enters COMPLETELY into the tunnel, but in the CO of the train, the tunnel shortens, and the train does not enter completely.

Everyone knows that this is a consequence of the non-simultaneity of events at the beginnings and ends of the train and the tunnel.

But what if we turn on the light in the entire train all the time? The reasoning is completely different. Everything will depend on the observer. Let's place the observer so that the distances to the beginning and end of the train and the tunnel are the same when the train passes through the tunnel. The light is on all the time.

Then in the train CO the light will always be visible, but in the tunnel CO there will be a moment when there will be no light.

These are completely different events (there is light and there is no light)... Some kind of paradox.

In fact, there will be darkening in all IFRs. Even in the case of two observers, one stationary in the tunnel IFR and the other in the train IFR, and having a common collision point where the light disappears.

This is not a paradox.

33. Space, matter, ether and Galileo's Principle of Relativity.

Sha S.V.

They claim that to define Space, it is necessary to establish material reference points in it, but then it will be possible to establish whether one body moves relative to another or vice versa, and this contradicts Galileo's Principle of Relativity. And therefore, Space exists separately from matter. After all, it is always possible to determine whether a material point is attached to a point in Space. In the same way, with ether, it is possible to establish whether it moves or

not. Therefore, refuting this, Galileo's Principle of Relativity sets the Principles of Space and Matter, and rejects ether.

34. Logic.

Sha S.V.

Mathematical Logic is based on the theory of Sets.

We take a condition and consider True those elements that satisfy this condition, and consider those that do not satisfy to be False. But in fact, this is not so. True, on the one hand, are those that satisfy, and True, those that do not satisfy (they simply DO NOT satisfy, and they are conditionally assigned the value of False). Further, in order to use this "Logic on the theory of Sets", True is assigned 1, and False -1.

$1 * 1 = 1$, $1 * (- 1) = (- 1)$, $(- 1) * 1 = (- 1)$ and $(- 1) * (- 1) = 1$.

In the sense that Truth from Truth will be Truth, Truth from False will be False, False from Truth will be False, False from False will be Truth, during the multiply operation.

But Truth can exist on its own, and Falsehood can only parasitize on Truth. Falsehood cannot exist on its own! That is why it does not work out that the opposite of Falsehood is Truth. It would be necessary to introduce in multiplication: Truth 1, and False 0.

Then: $1*1=1$, $1*0=0$, $0*1=0$ and $0*0=0$. That would be more precise.

It differs from formal logic only in the last thing, that a False from a False will be a False, during the operation of multiplying.

(I heard the idea that Truth exists on its own, and Lies only parasitize on Truth, in Aida Manasarova's 1974 film, "Seeking My Destiny.")

In this case, the Liar paradox is easily solved.

And this also explains the legitimacy of using proof of theorems "by contradiction".

35. Phase shift in inductance and capacitance.

Sha S.V.

The cause is the voltage, the current is the effect. This is for all devices. Therefore, the phase shift must be positive.

For capacitance, the current shift relative to voltage $-\frac{\pi}{2}$ is .

And for inductance, it is considered $\frac{\pi}{2}$.

Is this true?

It looks like the capacity and $\frac{3\pi}{2}$.

Sometimes it is important to take this lag into account.

36. Various proportions in physics.

Sha S.V.

1:4 is a ratio discovered and explained by Mendel in genetics. Two different elements were taken. In the first generation, they simply mixed. And in the second, a ratio of 1:4 appeared. More details: we take the AA and BB genes. In the first generation, they combine into AB and BA. But in the second, we get AA, AB, BA, and BB. A is a dominant trait. If it is present, it is inherited, and B is inherited only with BB. So we get 1 (BB) to 4 (the total number of options: AA, AB, BA, and BB).

Later, Gamow explained in a similar way the proportion of the original hydrogen to helium 1:3 or 1:4 ($4=1+3$). The mechanism is the same.

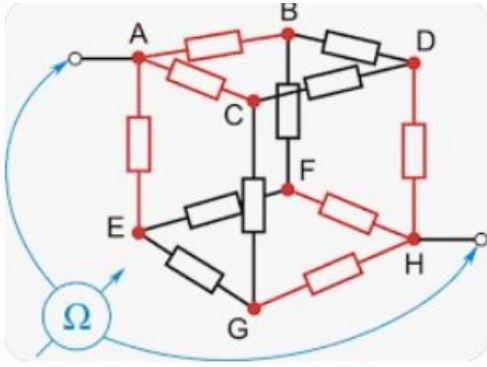
1:6 appears in thermodynamics when explaining pressure through the kinetic theory of gases. There, molecules can move in 3 dimensions and in 2 directions in each dimension. $3*2=6$. So when calculating pressure, the coefficient is 1:6.

The ratio of matter to dark matter is also 1:6. Surely, this is also connected with the three-dimensionality of space. Plus (more precisely, multiply) two opposite directions for each dimension.

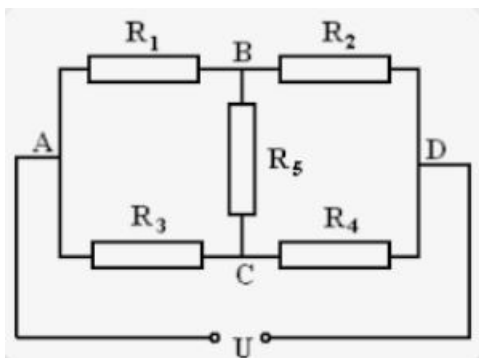
37. Electric bridge.

Sha S.V.

Let's consider an electric cube with equal resistances:



Its total resistance can be calculated without Kirchhoff's rules and symmetry. Place the potentials at the vertices and solve the system of equations. You will succeed.



First we need to decide: how does the current start?

What comes first: Voltage or Current?

I believe that Voltage appears first, like the slope of a river bed. And only then does the electric current (electrons and protons) run along the "slope".

Then we need to consider how the stream runs along the fork of the channels. The small stream chooses one of the channels at random and runs like that until it becomes full-flowing. Then it starts running along the other channels.

Let's consider a symmetrical bridge without Kirchhoff's rules or taking symmetry into account. We get 5 unknowns and 3 equations.

Let's designate the voltage differences by elements, U_1 , U_2 , U_3 , U_4 , U_5 .

There are 5 unknowns and 3 levels :

$$U_1 + U_2 = u$$

$$U_3 + U_4 = u$$

$$U_1 + U_5 + U_4 = u$$

$$U_3 - U_5 + U_2 = u \text{ (extra)}$$

The system has no solution.

Moreover, taking into account symmetry, there are 2 possible options: 1) when to close instead of R_5 and 2) break instead of R_5 . And this means that when voltage

is applied it should go bang, it is enough to make the resistances very precisely. Any current will go through any central resistance, but for a very short time . There are no capacities and inductances, and therefore the pulse time can be very short.

A particle consists of a nucleus and a field. When voltage is applied to the circuit, the field first adjusts at the speed of light, and only then do the nuclei begin to move. So it turns out that voltage first adjusts, and the current adjusts to it. Only at the very beginning, the current is not the current we are used to. It can arise in pieces spontaneously and inside the circuit, and only then is it leveled out across the entire circuit.

So it turns out in the case of the bridge that at first the particle field adjusts the initial voltage without current. And this voltage has no solution. Other methods must be used here. One of them is that the solution corresponds to two states of the circuit: with a jumper instead of internal resistance, and without. An experiment must be conducted here. I think it will go boom.

38. When it gets warmer in an apartment, people freeze.

Sha S.V.

The apartment is getting warmer, but we are freezing. Yesterday I understood why: when the apartment is heated, the humidity increases, and the moisture takes away more heat. Moisture is cool and more conductive . And when it evaporates, some of the energy is taken away from the steam (we learned about evaporation energy in school).

39. The twin paradox in STR and GTR.

Sha S.V.

Let's consider the twin paradox. Both twins are at rest in space, where there is no gravity. One stays, and the other flies away and returns.

The second one first accelerates in a finite time, then flies as much as it wants at a constant speed, then turns around (with acceleration) in a finite time, flies back and slows down in a finite time for the first one.

In STR, there is a twin paradox. Let's consider GTR.

In GTR, the time of all accelerations is limited, therefore the acceleration defect is limited. And the flight time with a constant speed is arbitrary. Therefore, it is always possible to choose such a flight time with a constant speed that its time defect will be greater than the time defect with acceleration. This applies both to the system of a twin at rest and to a twin in flight. Therefore, the twin paradox also takes place in GTR.

AI (GPTGo.ai) replied:

Yes, the twin paradox occurs in both the Special Theory of Relativity (STR) and the General Theory of Relativity (GTR). In STR, as in GTR, the time of the processes of displacement and acceleration is limited, which affects the flow of time for each of the twins under different conditions of motion. When one twin remains at rest and the other goes on a journey, differences in the flow of time arise due to the change in speeds and accelerations. Thus, the twin paradox remains relevant in both STR and GTR.

My answer (Sha S.V.):

In the twin paradox, the important point is the change in the speed of motion to the opposite. This change makes a significant contribution, depending on the total time of motion. The term $-vx/c^2$ in the Lorentz transformations . This explains the paradox.

1. In the system of the twin at rest, the flying one experiences time dilation:

$$\Delta t' = \Delta t \sqrt{1 - \frac{v^2}{c^2}}$$

And the transition from v to $-v$ in the inertial frame of reference of the resting twin in the term $-vx/c^2$ is antisymmetric, and therefore the integral of this term is equal to zero.

2. In the system of the flying twin, the one at rest also has a time jump for the turn, when the speed changes direction. The system of the flying one is non-inertial , and therefore, as in classical mechanics, when moving to circular motions, we can introduce a centrifugal force, which does not exist, this is the force of inertia, and also at the point where the speed changes, as if transferring the coordinate x to the coordinate $-x$. This will set a jump in time. In more detail, we go from vx to $(-v)x$, and this is the same as going to $v(-x)$. By introducing such a jump in coordinates, we preserve inertia.

$$\Delta t = \Delta t' \sqrt{1 - \frac{v^2}{c^2}} + \frac{\Delta t' \frac{v^2}{c^2}}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{\Delta t'}{\sqrt{1 - \frac{v^2}{c^2}}}$$

This solves the twin paradox. The brother who flew will always be younger.