

Entropy passage through the black hole singularity in active galaxies

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ABSTRACT

The “big bang” hypothesis was based on three assumptions. First, Einstein in 1917 in *Cosmological considerations on the general theory of relativity* assumed that all mass of the world is the mass of our Galaxy, therefore unique one, since all mutual velocities in it are negligibly small compared to the speed of light. Then in 1927, Lemaître, doctor of physics and otherwise theologian, already in the title of his article assumed that all the mass of the world is constant, a Homogeneous universe of constant mass and increasing radius, taking into account the radial speed of extragalactic nebulae. And when Hubble 1929 published the article *Relation between distance and*

radial velocity in extragalactic nebulae, according to which they are receding faster the farther away they are; it was enough for Lemaître to assume that the whole world originated from a single point, from the Primordial Atom, *The Expanding Universe*, 1931.

None of these assumptions are correct. The paper proposes the method of a schematic representation of zero uncertainty vacuum symmetry as proof that every active galaxy could be a “big bang.”

Key Words: *Preons; Mobius strip; Open-loop strips; Fermions; Bosons; Standard Model; String theory; Weyl fermion; Dirac equation*

INTRODUCTION

Einstein was not able to explain his $c=\text{const}$ postulate in any other way than with mathematical symmetry, and after the EPR paradox, Bell's inequality and the experimentally confirmed fact that there are no “hidden variables”, it could be clear that the $c=\text{const}$ postulate cannot be explained on a macro level and that the chance, probability and uncertainty at the micro level are ontological [1]. In cosmology, the opinion gradually matured that some kind of ether still exists, but that no state of motion or rest can be attributed to it [2]. And why it cannot be attributed, that can be seen definitely from Feynman's work, because of virtuality [3]. I characterized such an ether with $c^2=\text{inertia}$, $c^2=\text{const}$. I characterized such an ether with c^2 inertia, $c^2=\text{const}$, where the speed of light is not a kinematical but a dynamic quantity, $c^2 = \frac{\Delta m}{h\nu}$ from the virtuality of the vacuum it creates both mass (with the gravity constant) and Planck's constant [4-5]. As long as a photon is in the vacuum, it is virtual, it has no specific energy, its time does not flow, its wavelength is also virtual, and it can be anywhere with equal probability, it all depends on the atom m_i ($i=1,2,3,4,5 \rightarrow \infty$) in which it is caught.

Here it adapts (by Lorentz transformations) to the coordinate system of that atom, its units of length and time—all according to the inertia of the entire universe. And inertia is characterized by the laws of conservation, from which, according to the Nether theorems,

symmetry arises. The symmetry of the vacuum and its zero-indeterminacy can be illustrated by the potential gravitational energy created by the Schwarzschild black hole in the entire surrounding space: the mass M of that black hole symmetrically corresponds to the mass $-M$ on this side of its horizon [6].

There are papers that derive Newton's law of gravity, both classical and relativistic, based on entropy, which, moreover, at greater distances (in the halos of galaxies, for example) give higher accuracy because the force of gravity, instead of $\propto 1/r^2$, is more accurately described with $\propto 1/r$, making the black mass assumption redundant [7]. For the same reasons, the graviton has become redundant, a photon, a quantum of electromagnetic energy, is sufficient. All based on the symmetry of the vacuum itself, which transmits real information faster than light, however, without real energy, i.e. only virtual. (If one of the entangled photons interacts with a real mass, its remote connection with its counterpart is broken and it leaves itself to the energetic fate of the environment where it is located an unknown distance away). From the same properties of the vacuum, Maxwell in 1859 derived the thermal distribution of gas-particle speeds in the absence of gravity, in a homogeneous and isotropic vacuum: homogeneous, that means relativity, in every point of space the coordinate origin can be equally taken; and isotropic, it means symmetry, an equal property in all directions.

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For linear symmetry, for example left to right, the Gaussian probability distribution applies: over time it is the same for the distance to the left as for the right, a bell-shaped diagram with a maximum at the origin of the coordinate system. However, space has three degrees of freedom, three independent velocity coordinates. For the probability function of kinetic energy distribution $f(v^2)$, it is necessary to take into account three independent probabilities of velocities by coordinates, and the only function that satisfies the condition $f(v^2)f(y^2)f(z^2)$ is logarithmic, so it is again a bell-shaped diagram, but with zero probability for any particle (it is quite improbable that any of them will be stationary, but only the one that man chooses to the koosystem binds to it) (Figure 1). So, in the modern notation with the Boltzmann constant k :

$$f(v^2) = 4\pi \left(\frac{m}{2\pi kT}\right)^{\frac{3}{2}} v^2 e^{-\frac{mv^2}{2kT}} \quad (1)$$

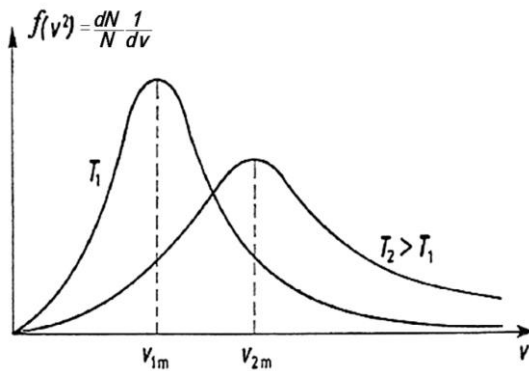


Figure 1) Maxwell-Boltzmann diagram of the velocity distribution of micro particles in the absence of gravitational influence

Sixty-five years after Maxwell, Bose also derived the law of blackbody radiation from the same properties of the vacuum, treating photons as an ideal gas, which in a given volume ΔV has a certain energy $E(v)$ [8]. He also starts from spherical symmetry, here with the square of the photon's momentum

$$4\pi p^2 dp = 4\pi \left(\frac{hv}{c}\right)^2 \frac{h}{c} dv \text{ where } p = \frac{hv}{c} \text{ is taken from}$$

$$E = pc = hv$$

In this way, we get

$$E(\lambda, T) = \frac{8\pi hc^2}{\lambda^5} \frac{1}{e^{\frac{hc}{\lambda kT}} - 1} \quad (2)$$

There, frequency is replaced by wavelength, more suitable for future analysis (Figure 2).

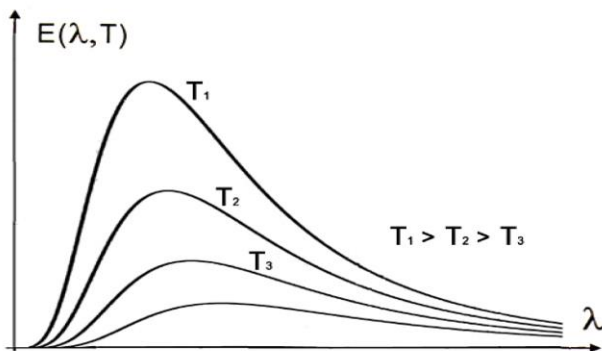


Figure 2) Diagram of the bulk density of the black body radiation depending on wavelength

on the wavelength of radiation

For the purpose of this article, it is good to keep also this in mind: the symmetry of the vacuum itself explains the action at a distance in the EPR-paradox, as well as the entropic transfer of information faster than light.

Entropy passage through the black hole singularity

If I know how something is now if I know how fast it is now changing, if I know the speed of that change and so on, I know it and in general, then I can predict what it will be like, in all likelihood, in some future time. The math says Taylor's series. However, it is not appropriate to expect constant analytical insight, nor is it easy to follow more and more derivatives, which can suddenly go wild, not to mention violent interruptions by violent people or a meteor suddenly falls and kills almost all life on Earth. But there is one special function whose derivatives are all equal, you are completely sure that they will be the same also at infinity—as if by inertia. And no matter where you are on the x coordinate, you can be the one 1 from whom everything begins—as Descartes would say: I think, therefore I am—both up to the sky and down to the tiniest tiny thing in the infinite. It is the exponential function with the base of the natural logarithm of the transcendental number e, it transcends both rational and irrational, everything. Everything can fail, even entire star worlds collapse, but the LOGIC of that function cannot, always, forever, eternal and unchanged like the vacuum itself, $y=e^x$. And behold miracles, its inverse function $x=lny$ is the Boltzmann function of entropy that is constantly increasing, always anew from zero—as Nietzsche would say: eternal repetition of the same. And that function—as if by inertia.

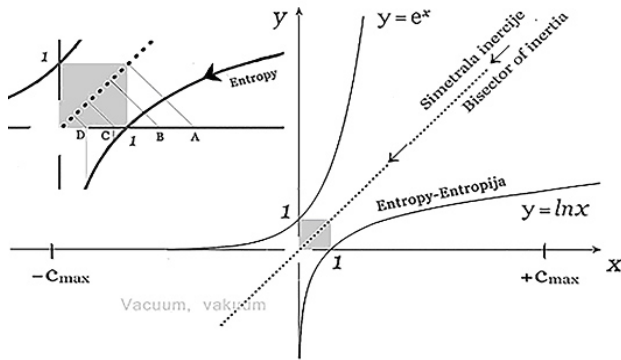
And if one and the other function are drawn in the Oxy coordinate system, mutual symmetry with a common bisector $y=x$ will appear, which is a feature of all mutually inverse functions because they actually describe the same phenomenon, once with x as an independent variable, the second time with y, no longer classical action and reaction, but interaction—concretely, it is the bisector of inertia. The coordinate x is the radial distance from the 0-coordinate origin as a possible singularity, which extends to infinity on both sides when it comes to a vacuum, although the gaze of the observer which stands in the singularity reaches C_{max} and $-C_{max}$ at most. For people who do not believe in the “big bang” as a beginning, the virtual vacuum is the same both before and behind that C_{max} -limitation, and for people who believe in the “big bang” as a beginning there is nothing behind that limitation because only there as far as did the primordial light come as cosmic microwave background so far metrics were formed, i.e. defined space—there is nothing further. For those people, the beginning is absolute, and for these others, that point is also relative, like every possible point m_i in the Universe [9].

All university textbooks on astronomy, exposition on the evolution of stars, begin with the formation of a protostar from cosmic dust in the expanses without galaxies, micro particles m_i ($i=1,2,3,etc \rightarrow \infty$) without the influence of gravity.

If there is an accidental exchange of photons between two particles, their wavelength itself maintains a constant distance by its constancy, so whether it is how much, whether they mutually rotate

or not, there is no reference, the only reference is the conservation of energy, $c^2 = \text{const}$. If the third gets tangled up, the triangle already appears with the π -sum of the angles, and with a multitude of particles, π may no longer be exactly true, gravity, compression and smaller space began to act, the temperature increased we can already observe a further decrease in entropy parallel to the increasing temperatures on the Planck radiation diagram, in the Figure 3.

Passage diagram of entropy through singularity



Schematic representation of zero-uncertainty simetry of the vacuum

(above, in the second quadrant)

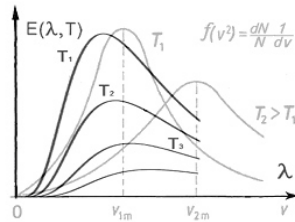


Figure 3) Schematic representation of zero-uncertainty symmetry of the vacuum.

The numerical values of the constants h , c , and k are such that already at the wavelengths of visible photons, the emissive power of the blackbody can be written without the unit in the denominator, so formulas (1) and (2) are practically of the same form, and due to the small constant b in Wien's law displacement, all the energy $E(\lambda, T)$ is already with the Compton wavelength for the electron before the singularity $(0, T)$.

In the case of a vacuum implosion together with the collapse of incidental masses, there are no definite particles, so the energy $E(\lambda, T)$ is also undetermined and the x -coordinate is determined by the relative ratio of wavelengths [10].

In the picture, passing through the singularity $(0, 1)$ it is shown graphically by diagrams, where $x_1 = x$ and $x_2 = y$.

In the construction of the diagram, $k_1 k_2 k_3 \dots e^{x_1 x_2 x_3} \dots = e^{k_1 k_2 k_3 \dots x_1 x_2 x_3}$ was used, i.e. from the countless parameters that influence the calculation, for qualitative analysis it is irrelevant what will be taken as the constant $k_i (i = 1, 2, 3 \dots \rightarrow \infty)$ and what about variable quantity $x_1, x_2, x_3, \dots \rightarrow \infty$.

The implosion of the vacuum goes along the x -axis in the direction of the coordinate origin: from an infinitely large value, the entropy decreases logarithmically to the point $(0, 1)$, compressing the energy

into the singularity of a single state—infinitely large, as Gamow writes, of both temperature and density [11].

The thermal energy Q is therefore opaque, all particles that would be created in it are instantly annihilated, and it is like a black body or exactly a black hole. From the mathematically infinite thermal energy that cools adiabatically according to Boyle-Mariot's hyperbolic law, and compensates its losses in the creation of nuclei from that infinity, it is not particularly difficult to calculate, when which and how big atomic weights—according to Compton's wavelength. It is incomparably more difficult to reach that singularity from the opposite direction, when the implosion of the vacuum has yet to reach that singularity, a singularity of infinite temperature and density, but with an uncertain amount of energy-mass - and only after passing through it the adiabatic expansion of the radius of the Big Bang at the speed of light up to the current interval $-c_{\text{max}}, +c_{\text{max}}$. Until such a singularity was reached, namely, there had been already realized particles with mass that always represented a part of the energy of that Big Bang—the ascending line to the singularity must be interrupted by a drop in energy with each new creation of each new type of particle.

Just as Gamow's hyperbole of cooling is punctuated by “teeth” with each trip, a new release of a type of particles. The coordinate axes have changed places. In the Maxwell-Boltzmann diagram, the kinetic energy of each individual mass (thus the total energy) is determined because the length (velocity) is determined, now on the x -axis. And the relative probability distribution of the number of particles with mass is on the y -axis.

Schematic representation of the zero-uncertainty symmetry of the vacuum

The logarithmic function of entropy, decreasing from infinity according to the logic of bisector inertia, for $x=A$ comes to a black hole, the perpendicular line from the point $(1, 1)$ falls to the point A of the Ox -axis. (See the diagram above in the second quadrant). All particle-wave material orbits around the centre of the black hole, gradually approaching it, at what speed it is shown by the perpendicular lines from the series of points A, B, C, D on the bisector of inertia. For $x=1$, a “big bang” occurs, graphically the point $(1, 0)$ passes through the point $(0, 0)$ into the symmetric point $(0, 1)$. The axes Ox and Oy change places, $-\infty$ when the points $C, D \rightarrow 0$ becomes $+\infty$ on the new Oy -axis, it is now an infinitely large density of heat energy whose cooling Gamow followed by calculating the percentage of chemical elements in the universe.

Mathematical derivations in the paper predict non-thermal radiation of a black hole during gravitational collapse and thermal radiation after the collapse. This schematic representation and mathematical analysis in the paper should be kept in mind when observing active galaxies, which non-thermally radio-radiate and eject a stream of matter outside the galaxy and up to a million light-years away [10-12]. When passing through the space-time indeterminacy of a black hole and an explosive of the transition from the point $(1, 0)$ to the symmetric point $(0, 1)$, a frequency shift is possible, it is possible that the counter-teeth in the spectrum of the ejected jet again into distant space without the influence of gravity do not correspond to the counter-teeth calculated by Gamow [13].

But if several counter-teeth, with the eventual correction of the scheme proposed here, coincide symmetrically with the teeth that Gamow found, then, firstly, we proved to the doubting Tomas (what was logical even without proof) that there was not just one so-called “big bang” and, secondly, we have at least shown that an ordinary galaxy with thermal radiation is probably the next evolutionary stage of active galaxies.

CONCLUSION

But if several counter-teeth coincide symmetrically, the Passage diagram of entropy through singularity shows the origin of the Planck black body radiation diagram parallel with the origin of the Maxwell-Boltzmann thermal distribution: it tends to zero, $\lambda \rightarrow 0$, several times faster than the Maxwell-Boltzmann distribution at the highest temperatures, and faster with increasing wavelength tends to its maximum by cutting the Maxwell-Boltzmann upward line because due to the inertia of mass particles it is less steep. The non-thermal spectrum of active galaxies is continuously ascending with different cut-off teeth of the emission radiation. This is the reason that the observation tables should be made by checking each calculated counter-tooth of an active galaxy: according to the scheme, the frequency shift found should be compared with the recorded teeth—without the prejudice that we came from the same “big bang” as that spectrum of the active galaxy. Otherwise, we will dismiss fine differences in frequencies as random artefacts. Only with the awareness that there was not just one big bang, can one properly see the cosmos and understand the Universe.

The function $y=e^x$ keeps all the mentioned properties if the point $x=0$ moves up or down along the bisector of inertia. The change in the horizontal “absolute” zero temperature T (which is normally over the gas constant in relation to Planck's uncertainty constant) together with the symmetric distances $-c_{\max}$ and $+c_{\max}$ nothing changes except the dioptr with which we look at that symmetry: from the micro-world we are in the macro-world or perhaps already in the imaginary world of Riemannian complex infinity behind our c_{\max} and the cosmic background microwave. Universal constants are always just cosmological constants (in the ancient Greek sense, what they could see was called the cosmos).

ACKNOWLEDGEMENT

It is dedicated to the idea that science and religion do not have to contradict each other, if religion allows a metaphorical interpretation of the holy books, no matter how rigidly each of them insists on its ritual customs, and if science sees that even the theory of relativity is insufficiently relative, i.e. that coordinate systems related to virtuality should also be taken into consideration if one wants to guess the answer to the question: **How come the world exists?**

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