

## FOUNDATIONS OF THE STRUCTURE OF THE UNIVERSE

**Feliks F. Gorbatsevich**

[gorich@geoksc.apatity.ru](mailto:gorich@geoksc.apatity.ru)

The recognition of the presence of ether as a medium, more or less uniformly filling space, generates a need for revision of the present dominant notions of space-time relations in the universe. As is known, the dominant notion is that time and space are a unified physical entity. This was suggested by H. Minkovsky in 1905. Minkovsky's unified space-time is characterized by three space coordinates, for instance,  $x$ ,  $y$ ,  $z$ , and time  $t$ . The space-time metric in the theory of relativity is written [1]:

$$ds^2 = c^2 dt^2 - dx^2 - dy^2 - dz^2, \quad (1)$$

where  $ds$  is displacement.

In this equation, the space-time dimension is expressed by a combination of a meter and second (or their equivalents). At the same time, it is known that the vacuum or the ether medium possesses dielectric and magnetic permeability and wave resistance. For instance, the dimension of the vacuum dielectric permeability  $\epsilon_0$  in the SI units is expressed in  $m^{-3}kg^{-1}s^4a^2$ , magnetic permeability of the vacuum  $\mu_0$  - in  $m kg s^{-2}a^{-2}$  and its wave resistance – in  $m^2 kg^{-3}a^{-2}$  [2].

As follows from the above, besides size and time, these dimensions include the current strength value  $a$  – ampere and the mass value ( $kg$ ). Thus, electrical, magnetic and other vacuum properties are determined by the categories of extension ( $m$ ), time ( $s$ ), mass ( $kg$ ) and current strength ( $a$ ). Physical properties of the vacuum cannot be expressed only as measures of length, time or motion. Their dimensions also contain the units of current strength and mass.

As shown above, the displacement currents in the vacuum between the plates of the charged capacitor determine its charge. The value of the magnetic field around the current conductor is determined by the value of this current. The value of a self-inductance current arising at the current conductor disconnection is determined by the value of the stored magnetic field energy in the vacuum around the conductor. To date, not a single reliable experiment exists that would show the possibility of divesting the vacuum of its magnetic properties. On the contrary, simple action, for instance, with a magnet and a piece of iron, indicate the electromagnetic properties of

the vacuum or the ether medium. The electromagnetic properties of the vacuum are of vital importance in micro interactions. Also, there are very strong magnetic fields in astro-space, as has been established by astronomers.

On the other hand, on the basis of philosophical, theoretical and physical analyses of the aspects related to the proof of four-dimensionality of space-time, the following conclusion was drawn in [1]: “The issue of theoretical justification of (3+1) dimensional nature of space–time is still enigmatic. It should be acknowledged that up to now we do not know what causes four-dimensionality of the real world. Information available on this subject represents only the first attempts to move forward in the desired direction”.

Thus, considering Eq. (1) on the whole, we should acknowledge that it was the result of some agreement. It is suitable for description of moving material bodies. But space is also in essence, independent of material bodies, since it may exist without them. At the same time, the state of the void (with a material body) can be changed by establishing, for instance, a magnetic field in it. This state of space cannot be constituted only by physical values contained in Eq. (1). From this it follows that Eq. (1) is really the result of an agreement and does not reflect the real essence of the universe. As is known, an agreement may be useful at some stage of theoretical development, but it cannot be used as the basis for a physical law that reflects real interactions of material bodies.

Thus, Minkovsky’s concept of space-time as the basis for the general and special theories of relativity is not a complete one, since it does not take into account electromagnetic properties of the vacuum. It does not reflect features of the real vacuum (that we call the ether medium) properly and fully. Space-time is some mathematical abstraction that may be applied for consideration only of some particular processes.

As follows from the principle constants of the vacuum (ether medium), the main components of cosmos are space, time, mass and electric charge (current). Accordingly, the universe includes the following categories [3]:

I. Space: Space is admitted to be an objective essence enclosing a visible and invisible (i.e. beyond our perception) universe. Space is determined by a measure of length (distance).

II. Ether medium (vacuum): The ether medium uniformly fills visible space. It possesses a spatial, netlike structure and physical properties. This structure consists of two equal but oppositely signed charges. The ether medium is determined by measures of length, time, mass and electrical charge (current).

III. Mass: The ether and physical media possess mass. The mass value is determined by its inertness (sluggishness), i.e. by the ability to acquire one or another value of acceleration or deceleration under force. As evidenced by the experiments on charging a vacuum capacitor and

observations of the phenomenon of self-inducing electromotive force in the conductor with current varying in value, the ether medium possesses mass. The dimensions of the ether and physical masses differ. The mass of a physical body is determined by Newton's law: the body's acceleration under force is proportional to this force value and inversely proportional to the body's mass.

IV. Time: The changing succession of the state, properties and position of a physical object can serve as a time measure. Time corresponds to this object. The count of vibrating (periodic) deformations of the ether medium can also serve as a time measure. The movement of a physical body in relation to some coordinate system can be fixed in time determined, for instance, by a vibrating (periodic) process occurring on the object that has no relation to the physical body.

V. Electric charge (current): The electric charge (current) value determines the rate of deformation of the ether medium by an immovable (moving) electric charge. The electric charge (current) value is measured, for instance, by coulomb (ampere).

On the whole, the hierarchy of categories constituting the universe shows up as follows. Space embraces everything. It is rigid, Euclidean and three-dimensional. Space is filled by the ether medium. The ether medium can be deformed under the effect of external physical bodies and electromagnetic fields and its density can be different at various points.

It can experience static and dynamic, shear and torsion deformations. The ether medium is the basis for electromagnetic wave propagation and transmission of a gravitational influence of physical bodies upon each other. Physical bodies (elementary particles, gases, liquids, solid bodies, plasma etc.) are placed in the space and ether medium. The gravitational influence of one physical body on another is performed by the ether medium. Dynamic processes in the ether medium and movements of physical bodies can be fixed in time.

## REFERENCES

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