NEW ETHER NEW PHYSICS

PHYSICAL SPACE WITH ITS PHYSICAL PROPERTY LIKE NEW ETHER

by Giovanni Ruffino (Genoa)

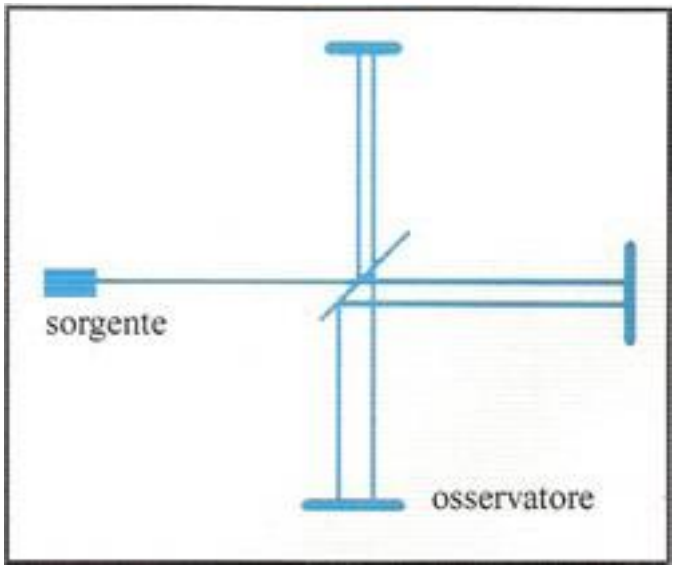
Einstein had left the ether in 1905, but he resumed it in 1916 after General Relativity, and proposed to identify the ether with - physical space with its physical properties - as already explained by Drude and Abraham towards the end of the nineteenth century. Ether, then, is no longer a foreign substance contained within space, as were all previous models. These hypothesis is fully adopted in all our writings of this site, and we will try to highlight well the physical properties of space and all contradictions of the - nothingness – as model of space.
And we will use the words: ether, space, space-ether and space-time all with the same meaning of – physical space with its physical property -.

In the first decade of the twentieth century physicists began to abandon gradually the ether and to identify the empty space with nothingness.
In the nothingness, by definition, nothing should happen. Instead we know that in the space many physical phenomena occur. In fact, we find: the electric and magnetic inductions of "vacuum", the displacement current, the fields that can exert interactions at distance, the energy associated with the fields, the electric potential of the vacuum, the curvature of the vacuum, the gravitational and electromagnetic waves and also the temperature of the vacuum.
In space with electromagnetic waves can also travel hundreds of radio and television broadcasts, so we have the nothingness of vacuum with the News inside!
Furthermore, in the "vacuum" virtual particles are generated and annihilate, mostly electron-positron pairs or quark-antiquark, and also has widespread presence of energy, bosons and other particles.
Associated to the fields in space there is energy, so we have nothingness of vacuum, which should not contain anything that instead, ironically, contains Joules of energy.

First, with the ether, it was possible to associate these physical phenomena in the space with substantial state of the ether. Currently to explain everything that happens in empty space, the University and the texts use the abstract concept of the field, defined however as a state of nothingness. They also speak of "inherent physical properties of vacuum space", which is always an abstract way of thinking, because if you identify the space with nothingness, then can't be anything giving physical concreteness to these properties.
For example, the electromagnetic waves are associated with oscillations of the electromagnetic vacuum induction propagating in space; but it is always a purely abstract idea, because if there's nothing, what is polarized and swinging?
But all these phenomena really occur in space, then we should have doubts Imagining "vacuum" space as the nothingness.
Before the twentieth century the vast majority of scientists were in favor of the ether. Among these: Faraday, Maxwell, Michelson and Lorentz, just to mention the most famous.
Descartes argued that to make logical sense to the spatial extension is necessary a means. In fact, defining a cubic meter of space, or a hundred cubic meters of space, it has a logical sense. While defining a cubic meter of nothingness, or a hundred cubic meters of nothingness it doesn't have logical sense. Then it is clear that we can't identify the space with nothingness, because a cubic meter of space is something, and it is not – nothingness-.
Newton, for the gravitational forces, wrote: - To assert that two distant bodies can act at a distance without the presence of an intermediate medium, it is completely absurd -.
Faraday and Maxwell imagined the electromagnetic fields like physical states of the ether.
Einstein at the time of special relativity abandoned the ether; but after have presented the theory of general relativity where he exposed the curvature of space, in front of the evident paradox of nothingness that should bend, he retraced his thoughts and later introduced a new model of ether, which was soon forgotten, or rather, obscured, by physicists of his time, who were already oriented towards the space made of nothingness. And even today it is difficult to find references.
This new position of Einstein, however, is very well exposed in the book - Einstein and the ether - Kostro author; documenting with reference to Einstein's original writings.
Despite the obvious inconsistencies of space made of nothingness, the ether

was removed. But was maintained fields and waves, and all physical properties mentioned earlier were assigned to nothingness .
All these abstract concepts are now commonly used, and many of us have forgotten that they are abstract. In fact, many people are convinced that to explain the forces that two bodies can exchange at a distance, is enough to exclaim - with the field! - And then draw two vectors on a sheet of paper or on the blackboard. Without thinking as a completely abstract entity, as the field inside the nothingness, which is a pure graphic and mathematical formalism devoid of any substantial physicality, instead can exercise true and real forces. It is clear that something is missing; and it is necessary to ask oneself what physically is the field in space and how it manages to interact with matter, exerting forces on objects.
The same argument can be extended to the curvature of the vacuum, and all electromagnetic phenomena, including waves, the electromotive forces induced by flux variations, and the famous displacement current.
On the other hand, it must be told that all previous models of ether, including the luminiferous ether of Maxwell, considered the particles and objects as foreign bodies, and this inevitably would have involved an obstacle to their movement for the "ether wind", which instead just does not exist. This incongruity, together the Michelson – Morley experiment and the Principle of Relativity contributed to the abandonment of the ether.

Let us examine the Michelson - Morley experiment .



Michelson Interferometer

The experiment of Michelson - Morley was performed in America in 1887, it uses the interferometer shown schematically in the figure. Briefly we say that

two beams perpendicular to each other, obtained by a semitransparent mirror, after being reflected again, both come to an ocular capable of evaluating the interference fringes, in order to evaluate if a ray is delayed respect to the other, after the respective paths. It is like the problem of the two swimmers, one must cross the river by swimming perpendicular to the current, outward and return journeys; the other has to cover the same distance before swimming against the current, up the river, and then in favor of the current returning to start point. In the experiment the two swimmers are the two rays of light and the river current is the flow of ether through the instrument in motion with the Earth. It should arrive before the beam perpendicular to the motion; instead, the two rays, with surprise, came always on par without phase shift, and rotating the interferometer on a horizontal plane, the interference fringes did not change.
The negative result of the experiment was quickly used by detractors of the ether to deny its existence.
The Irish Fitzgerald was the first to propose a curious and innovative idea: the side of the interferometer parallel to the motion undergoes a contraction, according to the formula

$l = lo * \sqrt{(1-\beta^2)}$ with $\beta = v/c$, v = object speed, c = speed of light.

And for this reason the times of the two paths are perfectly identical. At first it seemed only a strange and arbitrary hypothesis, but after it became very plausible by theoretical research of Lorentz and Larmor.
The two scientists proposed what follows: the shape and dimensions of a body depend of cohesion forces between the atoms, and these forces are produced by electromagnetic fields; but the shape and extent of fields can vary in function of the speed of the body and as a result there will be a rearrangement of the shape and the size of the body, in accordance with Fitzgerald's formula.
In the second half of the twentieth century this contraction has been accepted as true and real from Physics. Indeed we can find it on all physics books. It also constitutes one of the basic concepts of the theory of relativity, known as length contraction with motion, or contraction of Lorentz.
The Michelson – Morley experiment then failed to detect the effect of the motion of the Earth relative to the ether because the delay of one of the two light rays is perfectly compensated by contraction of the interferometer side

parallel to the motion.
However, even today, some people continue to propose this experiment as the definitive proof of the nonexistence of the ether, ignoring, or denying, this contraction of interferometer side. Despite this explanation was already known in the last years of the nineteenth century and it is clearly exposed in several books, such as the famous: - Six pieces less easy - of Feynman. To determine the absolute motion relative to the ether were made also many other experiments, all with negative results, because somewhere there is always a contraction of Fitzgerald-Lorentz.
At the end they were convinced that it will never be possible to determine our absolute motion state, at least looking only inside our laboratory.
From this experimental impossibility derives the principle of relativity: it is impossible to determine the absolute uniform motion with respect to space (looking only inside the laboratory).
Some people assert that the principle of special relativity, denying the existence of an absolute reference, also denies the existence of the ether. But this is a falsehood, because being the ether - not observable -, it is perfectly obvious that it is impossible to define a reference bound to it; so there is no incompatibility between the existence of the ether and the principle of relativity.
Moreover, it is the first principle that derives from experimental inability to determine the absolute motion (just looking inside the laboratory), and not the opposite.
The space- ether is - not observable - but it is necessary to precise: directly. But it exists because its effects and its physical property are already evident and numerous.
It is very important to add that if the observer looks even outside the laboratory, for example, if he observes "the fixed stars", or the others galaxies, or the background radiation, then from these observations he may have accurate information on his motion with respect to space. As we have already said, all the old models of ether considered objects as foreign bodies, and with the motion they must meet the wind of ether, which instead just doesn’t exist; and this was another important reason of his abandonment.
The new model of space-ether, proposed by Einstein after 1916, considers the particles of matter as effects of the energy in the space-ether, and not as foreign bodies. Each particle is formed in the point where the energy has shifted and exceeds a particular value. In this way we no longer have the

ether wind.
But before talking about this, it is necessary to consider, at least briefly, what is really the mass and matter.
We know that matter is made of atoms. And the word atom literally means: - that you can't cut -, or - indivisible-.
Never term was used most inappropriately.
In fact, inside the atom we find the nucleus, inside the nucleus there are protons and neutrons, and within they we find quarks. With regard to the volumes we have that protons and neutrons are billions of times smaller than atoms, so that all the nucleons that constitute the volume of a person occupying about a millionth cubic millimeter. The quarks are millions of times smaller than the nucleons, and in turn they are made of something, not yet well defined, but much smaller than quarks themselves.
To decompose smaller particles need bigger energies; it is only necessary the technological means to reach these energies and then what before was considered indivisible, in turn will be broken into much smaller parts.
In conclusion if we look inside of the particles, we just found energy, fields and their quanta.
Einstein, after General Relativity, returned to ether and adopted the model of Drude and Abraham: the ether like physical space with its physical property, as already written. And he proposed, in full account with previous considerations, this new physical framework : each particle is created from energy, it is an event that occurs in the space-ether where the oscillatory state of energy exceeds a certain level, and annihilates itself where the energy drops below that level, releasing energy in the surrounding space, and reforming immediately after.
Therefore the particle is not a foreign object in the space, but it is an energy effect, which is formed "in some way", perhaps as a local densification, or more probably as a "punctiform vibration" of the ether. And this effect of energy moves at different points, where the energy has shifted.
In the point where there is the particle, the energy density is very high. The energy in space is now associated with an real physical state of the space-ether, and it is no longer thought as an abstract nothingness state.
Also the fields find full logical sense as states of space-ether, and not as abstract concepts of nothingness. Space is therefore the spatial scenario that makes a substantial support to all physical reality, from matter to fields.
The energy that generates all the particles of a macroscopic body can move freely also at very high speed, and consequently moving the particles that it

creates, without encountering any opposition, if not that of external fields. This allows the bodies to move freely in space, as do the planets and all the moving objects, without the resistance of the of ether wind.
The space-ether, in addition to giving the logical sense to the spatial extension, now also assumes the property of - Mother Substance -, that contains and generates within himself the entire Physics: energy, fields, particles and macroscopic bodies.
This new concept gives full physical meaning to the correspondence between mass and energy, expressed by the famous equation $E = mc^2$, and to the corpuscular and wave nature of particles.
Forces at a distance, also called interactions, that act between two or more away bodies, find a clear and consistent explanation like the effect of ether tendency to assume the state of minimum potential energy.
Even the three formulas of Lorentz:

$l = lo \cdot \sqrt{(1-\beta^2)}$, $m = mo / \sqrt{(1-\beta^2)}$, $dt' = dt / \sqrt{(1-\beta^2)}$, with $\beta = v / c$,

and the equation $E = mc^2$,

can be clearly interpreted thinking that the energy, which originates the particles and objects, change quantitatively with the speed, but also the shape and extension of the fields change with the speed; and in these new states of equilibrium, the movements of the particles occur with different times.
The energy that generates all physical reality, including ourselves, remembers the creative breath of the Holy Scriptures, or the Prana of eastern Religion. And here we also find a meeting point between Physics and Religions.
From this point forward, everyone can proceed according to their own personal beliefs.

Many Thanks for the reading.

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2) Energy Mass Particles Fields Forces and New Ether of Physics

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