THE CONCEPTS OF GRAVITY AND SPACE OF NEWTON AND EINSTEIN AND THE FALSE INTERPRETATIONS OF MODERN PHYSICS.

by Giovanni Ruffino Genoa

Newton and Einstein are considered two great supporters of the concept of space as a passive, immutable and empty scenario, independent from the events that take place in it. Instead, both expressed themselves in exactly opposite way.

Newton is also credited with the idea of gravity as a distance action between two masses through the nothingness of the vacuum. On the contrary he precisely wrote that this idea is a huge absurdity, and he explicitly asked that it not be attributed to him. Let's see what they actually wrote.

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Let's start with Newton. In many books he is described as a supporter of gravitational actions at a distance, through the vacuum space, as an intrinsic property of the masses. Instead in 1693 he wrote:

<<It is unconceivable that inanimate brute matter should (without the mediation of something else which is not material) operate upon other matter without mutual contact; as if gravitation in the sense of Epicurus must be essential & inherent in it. And this is one reason why I desired you would not ascribe {innate} gravity to me. That gravity should be innate inherent & {essential} to matter so that one body may act upon another at a distance through a vacuum without the mediation of anything else by & through which their action or force {may} be conveyed from one to another, is to me so great an absurdity that I believe no man who has in philosophical matters any competent faculty of thinking can ever fall into it. Gravity must be caused by an agent {acting} constantly according to certain laws, but whether this agent be material or immaterial is a question that I have left to the consideration of my readers.>> Mail of Isaac Newton to Richard Bentley, February 25, 1693, from The Correspondence of Isaac Newton, editions by H.W. Turnbull, 7 vols., Cambridge University Press, Cambridge 1959-77, vol. 3, pp. 253-254.

Here it is very clear that Newton is absolutely against the distance action without an intermediate means and he asked explicitly that gravity like innate property of the mass not be attributed to him.

Intrinsic gravity with mass, instead, was formulated by Rogers Cotes, in his preface to the - Principia -, of which he edited the edition during Newton's life. Cotes argued that from experience derives the right to consider gravity as an intrinsic property of matter as much as extension and mobility. And when Newton's theory became established and spread in Europe, the opinion of Cotes prevailed rather than that of Newton.

And if Newton in - Principia - has used gravity without mentioning the properties of the intermediate medium, it is essentially for two reasons: the first for brevity, in order to make the exposition simpler and clearer; the second because at that time he did not know the way in

which physical space, or ether, acted up the two bodies to exercise the reciprocal gravitational action.

Indeed, in the second edition of the - Phylosophiae Naturalis Principia Mathematica - of 1713, in the final section entitled - Scolio Generale - he wrote:

<< In truth I have not yet succeeded in deducing from phenomena the reason for these properties of gravity, and I do not invent hypothesis. >> Which contains the famous Latin phrase: - Hypotheses non fingo -.

Some years later in Optics, third edition of 1717, Query 21, instead, he proposed a hypothesis:

<< Is not this medium much more rare in the dense Bodies of the Sun, of the stars, planets and comets that in the empty celestial space existing between them? And in passing from them to much greater distances, does not it continually become more and more dense, and causes for that very reason the gravitation of these large Bodies towards each other and theirs parts towards bodies: every Body making an effort to go by denser parts of the medium towards the rarer ones? Why, if this means was more rare inside the Body and the Sun than on its surface, and there more rare than the hundredth part of an inch from his body, and there more rare that in the orbit of Saturn, I see no reason why the increase in density must stop somewhere and not should rather continue across the distance from the Sun to Saturn and beyond: and although this increase in density may, at greater distances, be extremely small, however if strength elastic of this medium is extremely large, it can be enough to push the bodies from the denser parts of the medium towards the rarest, with all the power we call Gravity. >>

Query 21.

Here it is very clear that Newton proposes a medium (the ether) that fills space and with its different density causes the gravitational forces that act on celestial objects, but also on terrestrial ones. With this hypothesis, as ether and space cannot be separated, Newton denies the concept of space as a passive, immobile, immutable and empty scenario, independent from the events that take place in it, which instead is falsely attributed to him by the literature of the twentieth century and also by a part of the more recent one. But he believes, instead, that the density of the medium varies according to the presence of the masses and the medium interacts with the matter with the force of gravity.

Summarizing:

1693 - letter to Bentley- Newton denies the action at a distance defining it "a huge absurdity" and expressly asks that it not be attributed to him. And he generically writes that "gravity must be caused by an agent (in space) that operates constantly according to certain laws".

1713 - Principia, 2nd Edition - He writes the famous phrase: << Hypotheses non fingo >> which means: - I do not invent hypothesis (on the nature of gravity because I have not been able to deduce from phenomena the reason for this property).

1717 - Optics, Query 21 - He proposes the hypothesis of the medium that fills all the space and that, with its different density, causes gravitational forces on celestial objects, but also on terrestrial ones.

At this point it is necessary to make some considerations.

The hypothesis of the gravitational action at a distance between two masses through the nothingness of vacuum belongs to the field of magic, not to physics, and Newton very clearly

wrote that he considers it a huge nonsense.

Newton is considered the genius number one, or at most number two, of human history. How is it possible that a complete nonsense like the action at a distance was attributed to him although he wrote exactly the opposite?

It cannot be a casual mistake, which would have been soon denied. As it is not a casual mistake to attribute to Newton the concept of empty space as a passive scenario, although he in the Query 21 clearly wrote of << means in the space that with its different density causes the force of gravity >>.

In both cases it is, evidently, a precise mystifying will implemented systematically by the scientific community in order to succeed in imposing the nothingness of the vacuum like concept of space.

Almost two centuries later, also Einstein in the General Relativity, with the curvature, made space participate in events. Of course there are substantial differences between the ideas of the two great scientists. The most important is that Einstein denies the ether like a substance distinct from space and contained in it, as were the previous models, including luminiferous ether. And in its place, after General Relativity, he proposes - physical space with its physical properties - as a new model of ether, which we can in short call "space-ether". Then, after 1916, Einstein was opposed to space understood as the nothingness of vacuum, and he stated that General Relativity would not have logical sense without a space-ether with physical properties.

We can therefore affirm that Einstein, with Special Relativity, identified space as the vacuum just from 1905 to 1916, and after 1916 with GR he proposed the space-ether.

In fact, General Relativity no longer considers gravitational forces, but states that the cause of gravitation is the curvature of space (or space-time) that acts on objects, forcing them to follow curved trajectories. Therefore, with the GR, space is no longer an empty and passive scenario, as it was with Special Relativity, but instead becomes a changeable physical entity that acts on the events that take place in it.

Here are some quotations by Einstein.

<< It would have been more correct if in my first publications I had limited myself to underline the impossibility of measuring the speed of the ether, instead of supporting its non-existence. Now I understand that with the word ether we mean nothing more than the need to represent space as a bearer of physical properties. »

(Albert Einstein, from a letter to A. H. Lorentz, 1919)

<< Even though in 1905 I thought that in physics we could not talk about ether at all, this judgment was too radical, as we can see with the next considerations of general relativity. It is therefore permissible to assume a filling medium in space if we refer to the electromagnetic field and therefore also to matter. However, it is not allowed to attribute to this medium a state of movement in every point in analogy with the ponderable matter. This aether cannot be conceived as consisting of particles. »

(Albert Einstein, Grundgedanken und Methoden der Relativitätstheorie in ihrer Entwicklung dargestellt, § 13, 1920)

<<To sum up, we can say that according to the theory of general relativity, space has physical qualities; in this sense, then, there is an ether. According to general relativity space without ether is unthinkable; in this space, not only the light could not propagate >> A. Einstein at the University of Leiden, 5 May 1920

Despite all this, science has transformed Newton and Einstein like the great supporters of empty space understood just like nothingness, forgetting, or omitting, that both have expressed themselves in exactly opposite sense.

Anyone wishing to explore Einstein's opinion on space-ether can read the book

- Einstein and the ether -, author Kostro.

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Also the Principle of Relativity of motion is interpreted, erroneously, for identifying space with nothingness of vacuum.

Actually all inertial reference systems are equivalent only for what happens "inside the ship's hold", in the sense that observers can perform all possible experiments inside the holds of their ships (or spaceships) and they will never notice any effect of their constant speed on the measurements performed.

Instead, looking outside and making measurements on external values, the effects of the observer's speed on the results of the measurements are immediately evident; for example with the Doppler effect by measuring the frequency of the light of a star located along the direction of motion. Also the measurement of background radiation gives precise indications on the observer's speed and it can be argued that the reference system for which the background radiation is isotropic is privileged over all others.

Another important role for the incorrect identification of space with the nothingness of the vacuum also came from the Michelson-Morley experiment, performed towards the end of the nineteenth century.

Very briefly, the experiment consisted of measurements of interference between two light beams after they had traveled the two orthogonal arms of an interferometer, which was oriented in various ways on a horizontal plane. The experiment had a negative outcome because the interference figures did not vary changing the orientation of the interferometer. Shortly after the experiment, Fitzgerald and Lorentz, for independent way, proposed the *contraction of the rulers in motion *, also called *Lorentz contraction*, expressed by the equation:

 $L = Lo \sqrt{1 - \beta^2}$ (with $\beta = v/c$, v speed of system, c speed of light) which clearly indicates that the length of the interferometer arm parallel to the speed of the Earth (which is not completely negligible compared to c) undergoes a contraction, whereas for the other arm, which is orthogonal to speed, this does not happen.

And it is for this reason that the figures of interference of the two rays did not change. But at that time Lorentz contraction was not accepted because it was just proposed and not yet verified.

Over the years, other scientists, including Eddington, repeated this explanation, Also Feynman in - Six Not-So-Easy Pieces - exposes a very clear description of the experiment in which he considers this contraction, which is currently accepted by all the physicists of the world. In fact the equation above written since many years is written on all the physics books. But despite all this, throughout the twentieth century the Michelson-Morley experiment was defined by the great majority of physicists as "the most important experiment in the history with a negative outcome" as if it were the absolute proof that it was necessary to identify the space with "the nothingness of vacuum".

Instead, when became evident that Lorentz contraction is absolutely true and real, it would have been necessary to completely reconsider the conclusions that followed the experiment. But this has not been done, except in a marginal way and only in recent times.

In the nineteenth century Faraday developed the concept of field related to electromagnetic forces and it was later extended to those gravitational.

Until the end of the nineteenth century, the field, electromagnetic or gravitational, was considered, by the great majority of scientists, like a physical state of the ether. In the twentieth century, instead, the ether was suppressed and the space was identified precisely with the nothingness of the vacuum. But the field was left inside the space! Thus the field became "something mysterious" not well defined in vacuum, and it ended up being considered an abstract entity.

To tell the truth, some authors shyly mention the field as: - something physical in space – or : - particular (physical) condition of space- but nothing more than this.

In addition to the fields we know that in space there are also other very important physical events: electromagnetic waves, gravitational waves, polarization, curvature, energy, displacement current, etc.. But the Physics of the twentieth century, wanting to identify the space with the nothingness of vacuum, it was forced to reduce also these true physical entities to abstract concepts, to mathematical formalisms.

So many people believe that the fields are just vectors drawn on a sheet, and they believe that the curvature of space is only the Riemann tensor, also it just written on a sheet. And the same for waves, polarization, displacement current, etc.

Now we must ask ourselves:

Why does everybody know that Einstein denied the ether with Special Relativity, whereas very few people know that after General Relativity he proposed - the physical space with physical properties - as a new model of ether?

Why is the absurd concept of gravity as a remote action, through nothingness, falsely attributed to Newton?

Why is the concept of space as a passive, empty and unchanging scenario falsely reported to Newton?

Why has the Lorentz contraction for the Michelson-Morley interferometer not been recognized before?

Why with fields, waves, polarization, curvature, displacement current, do we proceed as if they were just abstract entities and only the mathematical formalism existed and not also the true physical phenomenon in space?

It is clear that all these deceptions and falsehoods have the precise purpose of imposing the concept of space as the nothingness of the vacuum. And mainly behind all this there is the delirium of omnipotence of science that began in the nineteenth century and continued into the twentieth century, which cannot admit that there is something of which we know very little. And the main philosophical support behind these lies, which caused this distorted

development of the concept of space, is atheism, in fact nothing could exist in nothingness. Fortunately for us, now with Internet everyone can access the original writings of the great thinkers of history and we can easily deny all the falsehoods attributed to Newton and Einstein.

If instead they wanted to proceed in a correct and honest way, after having eliminated all the old models of ether, because they were wrong, in their place they would have had to recognize - the physical space with physical properties - that Einstein proposed after GR.

Then, as Newton did in his time with gravity, they could again affirm: - For the moment," we do not pretend hypothesis" on the nature of space and on that of all physical phenomena, true, that take place in space and we proceed equally only with the mathematical formalism.-And later they could begin to propose hypotheses about the nature of physical space and everything that happens in it.

This would have been the correct way to proceed.

If we recognized, finally, that the space is * something * of physical, then it would be necessary to take a further step forward and recognize that even particles, and therefore all matter, are effects of energy in this physical space (as Einstein proposed after GR). And all this would completely change our vision of the world bringing us back to the right level of humility.

And all the progress of modern physics of recent times, including QM, make ever more evident that space is *something* very important.

And it is precisely the missing link between science and faith.

It must be added that with << Hypotheses non fingo >> Newton has been able to "circumvent the obstacle" of the impossibility to understand the "why", the essence of gravity, and he could equally define the law of universal gravitation that has been very useful for the study of celestial mechanics and it is still used today for the launches of satellites in orbit around the Earth or towards other planets, and for other applications.

The important thing, however, is not to fall into the error of the action at a distance, or to believing that Newton's equation is the gravity, or believe that to explain gravity it is enough to exclaim - with the field! - and then trace two vectors on a sheet of paper, thus replacing the true physical phenomena with the graphic-mathematical formalism. Because we must always try to understand what a field is physically in space, and how physically space exerts gravity on the matter.

Then we must avoid confusing the true physical fact in its totality with the mathematical model.

We conclude with this quotation of Newton.

<< This very elegant company of the Sun, of the planets and of the comets could not be born without the design and the power of an intelligent and powerful entity. And if the fixed stars are centers of analogous systems, all these, being constructed with an identical design, will be subject to the power of the One: since the light of the fixed stars is of the same nature as the light of the Sun, and all systems send the light to all others. And so that the systems of the fixed stars do not fall, due to gravity, mutually one on the other, this itself put an immense distance between them >>.

- Scolio Generale -, in the second edition of Newton's Philosophiae Naturalis Principia Mathematica (1713).

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