

Holistic Physics

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Perception creates the impression that space is an unreactive void. Physicists have been constructing theories to account for the relative motion of bodies in this non-existing void, when actually these bodies are moving spontaneously to center themselves in a space medium made non-uniform by gravitational fields. Dynamics is inappropriate for describing the structure and natural order of matter. The premises and postulates of a new physics are given based on the principle that an object's motions and actions are inseparable from its environment.

Holistic physics is based on the proposition that everything in nature tends to the center of its interactive environment.

The Michelson-Morley experiment of 1887 showed that something is fundamentally wrong with Newtonian physics. The direct indication of the experiment is that the velocity of light is always constant. Why it should be constant can be due to either of two suppositions. Each forms a premise from which deduction leads to a particular physics.

1. Light's velocity is constant because we can't measure its changes.
2. Light and matter have unrelated motions.

It is generally assumed that Einstein resolved the Michelson-Morley paradox by his relativity theory. The fact is, he did not. Einstein kept the Newtonian impression that all motions are relative and concluded that the velocity of light is constant because of changes in objects when they are in motion. In this way any would-be change in light is nullified by a compensating change in the object used to measure it.

Einstein's assumed "causative factors", however, prove to be impossible for exactly the same reason the Lorentz and FitzGerald theories were impossible. It is not rationally possible for a contraction and time dilation in one reference frame to cause the velocities of two light beams in opposite directions at assume velocities $c - v$ and $c + v$ to simultaneously be converted to c . In other words, the presumed condition to nullify a reading of the earth's forward movement simply cannot, at the same time, nullify a change in reading of light's velocity in the opposite direction. The velocity of light is absolute, but it cannot be proven by invoking the movement of the earth.

The cause of light's constant velocity is not resolved by relativity.

Relativity is a difficult theory because it is the premise and not the deduction that is questionable. By assuming variance in physical properties of objects in motion Einstein could deduce equations that fitted experimental results. He kept Newton's impression that light moves through space the same way matter

moves through space and used Lorentz' and FitzGerald's idea that light's velocity is constant because changes in it cannot be measured due to contraction and time dilation. In other words, he didn't believe that the velocity of light is constant as a feature of nature but simply because of our inability to measure changes in it.

Einstein's theory works because of his assumed relativistic effects. It could be accepted that relativistic effects are merely abstract devices to make the equations accountable. The problem, however, is that advocates of relativity contend that they are physically real, that lengths contract, time slows, and masses do increase with velocities. And that results in a physical theory that is incompatible with one based on more realistic premises.

It is the other supposition for the Michelson-Morley result, therefore, that is probably correct and can be the basis of a more rational physical theory. That supposition, which becomes a premise upon which holistic physics evolves, is: Light and the relative motion of matter are unrelated motions.

A basic problem of physics is that the properties required of space to explain light waves, fields, inertia, and the origin of matter are not the properties of a void as we perceive space to be. It was the void of perception, however, that Newton and others adopted as the space of physical theories. There are no possible interactions with a void, so physicists conceived an image of a universe and everything in it being held together by force and all things moving in response to matter interacting with other matter across space. To make such a scenario coherent it was necessary to lace the mathematical descriptions together with factors and forces that have no physical evidence of existing.

The image of nature from our perspective, however, can be deceiving. Just as we have had to concede that it is the earth that is moving, it is quite possible that we have been deceived by our perception of space. There is a space misconception. When we see things moving through space we see them move relative to each other, and all moving relative to an immobile space background. It is this space, the absolute space of Newtonian physics, which gives us our impression of space. Since there is no resistance by this space we make the assumption that space is simply an unreactive void. There is, however, something seriously wrong with this impression. Experiments with light don't support it.

If now we take the second supposition, that light and matter have unrelated motions, then they must be moving to different references that define their motions. We need to reinstate the medium for light, so light moves through the medium and relative to it. Objects, on the other hand, have only motion relative to each other. Light moves and the earth moves, but not relative to each other. They are two unrelated motions. The Michelson-Morley experiment then was telling us that the earth does not move relative to light, or rather, to the medium through which light moves as waves. To make any sense out of this there have to be two kinds of space, one real and one our perceptual abstraction. The problem then becomes one of orientation.

1. There are two kinds of space: actual and perceptual.
 - a. space is imperceptible and non-material.
 - b. actual space is a medium and makes physical phenomena rational.
 - c. perceptual space is an abstraction we create as a background for relative motion.

Neither Newtonian physics nor relativity allow the existence of a medium in any rational way. Dynamics is constructed solely on the relative motion of objects affecting each other's motions in an unreactive void. Inertial motion and forces are then added to make the equations work. The admission of a medium would shift interactions to matter interacting directly with its space environment. The force concept and all subsequent development based on it would be rendered unnecessary and superfluous. There is, therefore, good reasons to believe that a physics based on holistic principles is far simpler and more representative of the basic order of nature.

That there is a medium was proven in 1913 by Georges Sagnac, a French physicist, who modified the Michelson-Morley experiment so that instead of doubling the path of the light beam back upon itself, directed a split beam of light around the edge of a 20-inch turn table. When the table was rotated and the light beam was brought on itself there now were interference fringes. The edge of the rotating table did indeed move relative to the light waves, or more correctly stated, relative to the medium of the light waves. In 1925 Michelson with Henry Gale adjusted his original experiment so that it was measuring the earth's rotation, and this too showed the Sagnac effect. Since the Sagnac effect was used to develop the optical gyroscopes that are widely employed in navigation, there is no question of its validity.

What we have then is a medium. It is redundant to say the medium is an ether in space. What it really means is that space itself is the medium. Light moves through the medium, but the earth in orbit does not. On the other hand, if something rotates, the circumference moves through the medium out of necessity with the center of the object remaining stationary. There is, therefore, irrefutable evidence that space as a medium does exist.

Space is a medium. With a medium and the space misconception the interpretation of the Michelson-Morley result points to the fact that light and matter do not move through space alike. Light moves as waves through the space medium at a constant velocity, while matter is stationary in its medium environment and moves only relative to other matter.

The motion of light through a space medium fits all rational requirements. It leaves only the question of how it is possible for the earth to be suspended in the space medium, while at the same time having an apparent motion around the sun. This requires a shift away from our perspective of dynamics of discrete bodies moving in space and to bodies in space being a part of their space environment. A change in the environment then is what causes the apparent motion. What appears to be the earth's movement through space is caused by the earth moving to remain centered in a non-uniformity space environment.

2. A medium called space
 - a. The medium has cohesion.
 - b. There is motion in and through the medium.
 - c. There are movements by the medium.
 - d. Motion in the medium is as waves.
 - e. Light moves as waves through the medium: fields are standing waves from and around matter.
 - f. Motions through the medium are absolute.

Electric fields differ by their opposed orientations. The intense attraction of opposed charges is, therefore, the force of consolidation of opposite potentials. Their orientations are conditions in the medium and the strong pulling together is a measure of the tension of the medium. If we accept that space is a medium, then light's velocity is determined by the tension of the medium. And from that it should be possible to calculate the velocity of light.

The calculation was made 140 years ago by James Clerk Maxwell when it was believed that an ether filled space and served the role of a luminiferous medium. That theory, however, developed from the impression that space is a void as we perceive it and a medium had to be added to it to carry light waves. Maxwell found that to make a coherent account of the electromagnetic equations he had to assume a medium consisting of an elastic solid. The assumption of elasticity suggested that the electromagnetic medium could support wave motion. Any elastic substance with density ρ and a shear modulus μ can transmit transverse waves with a velocity $v = (\mu/\rho)^{1/2}$.

Maxwell found that for a medium having magnetic permeability μ equal to unity, v was almost equal to the velocity of light. He concluded that the inference is unavoidable that light consists in the transverse undulations of the same medium which is the cause of electric and magnetic phenomena. From this theoretic approach he calculated the velocity of light to be 193,088 miles per second, within 1% of the measured value of 186,282 miles per second.

Maxwell believed initially that light waves were electric deformations in the electromagnetic medium. Later he suggested that it is possible to drop the electromagnetic medium and treat light as alternating electric and magnetic fields propagating themselves through space. This is the view adopted by physicists today, presumably because it is compatible with their image of space as an unreactive void. There is, however, sufficient reason to believe that Maxwell's presumed electro-magnetic medium is the space medium itself.

Maxwell's work showed that light is composed of and has properties derived from the space medium. Electrons and positrons consist of electromagnetism. It seems probable that in some way there was a bridge from the prematerial medium to photons and the formation of particles.

3. Fields shape the space medium.
 - a. Fields are reverberations in the medium of the structural motions of particles.
 - b. Particle oscillation creates a gravitational field.

- c. Electric fields stem from spiraling structural motions and are of opposed orientations.
- d. Fields retard the velocity of light and fields.

From this postulation two types of reverberations are possible. Pulsing or oscillating of the whole particle would reverberate the surrounding medium without any particular orientation. This apparently is the manner in which gravitational fields originate.

Electric fields, on the other hand, rise from an enclosing structural motion that cycles upon itself in either of two helical twists. This spiraling motion passes its shape to its reverberations and creates the electric field. Opposed orientations give opposed electric fields.

The interaction of an object's gravitational field with the surrounding space medium has the effect of suspending the object in space. Inertia is the resistance of the object's gravitational field to displacement. This compulsion to remain centered in its space environment causes a body in another stronger gravitational field to move spontaneously into the field to equalize its own field by the Doppler effect.

Reverberations in the space medium appear to weaken the tension of the medium. This slows the passage of waves through the medium and in effect retards the velocity of light. This also has the same effect on the equilibration rate of other fields, and this affects the equilibration of fields of lesser bodies and causes them to move spontaneously to remain centered.

The slowing of light's velocity and the equilibration of fields imparts a non-uniformity to the space medium which accounts for a pattern of interactions.

- 4. Interactions build combinations.
 - a. Interactions are either consolidations or displacements.
 - b. Interacting fields affect the relative motion of the sources.
 - c. Matter interacts by coupling of structures.

Interactions are either consolidations or displacements. Interactions that are consolidations occur between complementary shapes or activities. This means of consolidation is common throughout nature and the type of interaction depends on the character of the reactants. It is best known by the mechanics of chemical reactions.

Fields that are complementary also consolidate. Opposed electric fields exhibit a strong consolidation that manifests itself by the drawing together of their material sources. The interaction of opposed electric fields leads to atoms.

- 5. Matter is suspended in ambient space.
 - a. Matter is centered by its gravitational field and moves spontaneously in non-uniform space medium.
 - b. Inertia is the resistance of a gravitational field to displacement.
 - c. An applied force compresses an object's gravitational field and instills a

spontaneous and continuous fall in the line of force.

d. Relative motion of matter is a secondary effect.

The space of reality is a non-material medium. Because we cannot see space we have assumed it to be the uniform unreactive space of perception. In reality, space is actually a medium made non-uniform by gravitational fields. The space medium is the immediate environment of bodies in it. They interact with it through their gravitational fields which hold them in suspension. The velocity of light and the equilibration of fields is retarded in strong gravitational fields. Lesser bodies move spontaneously, therefore, to equalize their own fields by the Doppler effect to remain centered in their ambient space. The primary cause of motion of bodies in space is the compulsion for remaining centered. This means the relative motion of objects that we observe is a secondary effect of a direct interaction with their environment.

This readily accounts for objects falling into the gradient of a gravitational field. An added component of an object's motion is when a force is applied to the object perpendicular to its fall and against the resistance of its field to displacement. Instead of the force becoming acceleration of the mass as in dynamics, the force against the object's inertia is consumed in compressing the field opposite to the force and creating the same environmental effect as the object falling into a gradient.

6. Matter condensed from conditions of the medium.

- a. The cohesive forces are separated and equilibrate to photons.
- b. Elementary particles are formed from photons or photon precursors.
- c. Neutrinos are nuclei of complex particles.

Matter came from something, but to say it came from energy evades the issue. Energy in itself is not an entity. It is an abstraction when referring to motions of matter; it is synonymous with light and proportional to the frequency when referring to light. Matter originated from something prematerial and evolved to the many forms and compositions that we witness today. The most likely prematerial source of matter is the universal space medium. The space medium has properties of cohesion and wave motions, and in some way under special conditions these properties converted to particles of matter.

Under extreme conditions a property of the medium converts to particles of matter. A motion closes upon itself to be self-contained and partially separated from the medium. Particles, however, are not completely removed. They remain in contact with the surrounding medium, and motion within the particle is reflected as disturbances in the medium. Presumably these reverberations in the tension of the medium by the structural motion of particles is the way fields are produced.

7. Matter is built on a three-tier hierarchy of particles, atoms, and gravitational systems.

- a. Motion is inseparable from structure.
- b. The structural pattern of the hierarchy is motion around a nuclear core.
- c. The nucleus generates the space environment around which the system

forms.

The New Physics

Relativity is a modification of Newtonian dynamics with relative motion disengaged from its mooring and allowed to float in a reality made personal and centered on the observer. It is a mathematical description of nature as we see and measure it, but it does not portray a general universal order existing independent of us. The null result of the Michelson-Morley experiment indicated actually, not one, but two conditions of nature which were not realized by Newtonian physics:

1. The velocity of light is absolute.
2. A body is stationary relative to its space environment.

The first was the basis of relativity, but the second one solves the Michelson-Morley paradox. It is this other premise, therefore, that accounts for the null reading in the Michelson-Morley experiment. Light and matter are unrelated motions, and the velocity of light is constant, not because of our inability to measure its changes, but because it is a fundamental property of nature.

- I. Light and matter have unrelated motions.

If light and matter have unrelated motions then deduction leads to a physics different from that of dynamics. Light's velocity is constant because of the nature of its propagation, not our inability to measure its changes because of physical changes in bodies in motion. There is no logical basis in comparing relative motion of objects to the velocity of light, and there are therefore no relativistic effects. Bodies are centered in their space environments with invariant properties, while light moves through the space at a constant velocity.

With this premise these propositions follow:

1. Light moves relative to space; matter moves relative to matter. Matter and space are the fundamentals of reality. Motions require a reference for definition. Unrelated motions have different references. Motions relative to different references are not relative to each other. If matter moves relative to matter, then light moves relative to space.
2. Matter is stationary with respect to the space through which light moves. Matter does not move relative to the space of light's propagation. Matter must be stationary with respect to the space of light's propagation.
3. The space of light's transmission is not the perceptual space of relative motion. Wave motion is the means of energy transmission through a medium. Light is a wave condition in space. Matter is centered in its space environment by its gravitational field. A gravitational field in space resists displacement. A body cannot move through a space in which it is centered. The space of light a medium; the perceptual space of relative motion is an abstraction.

We see objects moving through space relative to each other and abstractly think of space as a stationary background. That space is created in our minds by the way we perceive things in motion. There is no resistance to bodies moving through this space simply because they are not actually interacting with this space. It is an abstraction. If bodies are centered in their space environments, and yet appear to move through space, then that space is not the uniform space of perception. Since we cannot see space, we cannot see its non-uniformity and assume it is uniform.

From these considerations a second premise can then be proposed:

II. Space is a non-material medium

The propositions derived from this premise are as follows:

1. Space is a non-material medium made non-uniform by gravitational fields. Light and fields are non-material. The space-medium in which light and fields move is non-material. A gravitational field retards the transmission of waves in it.
2. The velocity of light is determined by space. A medium determines the velocity of waves in it. Space is a non-material medium. Light consists of waves in space. Space determines the velocity of light.
3. Fields are conditions generated by matter in its surrounding space. Fields originate with the particle level of matter. Particles are in interaction with their space environment. Fields are conditions generated in space by a motion. Fields are reverberations of structural motion of particles in surrounding space.
4. Inertia is the resistance of a body's gravitational field to displacement. A gravitational field affects the space environment. A change cannot be induced without a counteraction. Force applied to a body in space is resisted by the gravitational field of the body.
5. Objects center themselves in their space environments. Gravitational fields are emanations of particles into surrounding space. A body is at the center of its gravitational field. The space environment consists of the condition of the gravitational field. Symmetrical interactions center a reactant between them.
6. Gravitational fields affect the velocity of light and fields in space. Experiments have demonstrated that the velocity of light waves is slower in gravitational fields. Fields equilibrate at the velocity of light. Gravitational fields presumably have slower equilibration rates in other gravitational fields.
7. Matter moves spontaneously in gravitational fields. A gravitational field affects the equilibration rate of other gravitational fields. A gravitational field is a gradient of diminishing intensity around its source. Matter centers itself in its space environment by its gravitational field. An object in a

gravitational field moves spontaneously to equalize its own gravitational field by the Doppler effect

8. Motion in the space medium is absolute.

Any motion in and relative to the space-medium is independent of the relative motion of matter. Force applied to overcome inertia extends the length of the orbit.

9. Relative motion of matter is a secondary effect.

The primary cause of free motion is response to a non-uniform space environment. Objects interact independently with their respective space environments. There is no direct interaction between objects in free motion.

In analysis we discover that on all levels of material existence motion is an integral structural feature. Not only are structure and motion inseparable, matter is in actuality structurally contained motion. It is motion, therefore, and nothing more that lies at the base of matter's formation and hierarchy. Particles condensed from photonic motion in the space medium; the structural motion of particles creates the electric and gravitational fields that are the conditions in space in which atoms and gravitational systems form. Atoms contain within their confines the entire electric fields of its electrons and protons, while satellites orbit central bodies in response to a compulsion to center themselves in the environment of the stronger gravitational field.

From these considerations a third premise follows:

III. Matter is structured motion.

1. Motion and the structure of matter are inseparable.

On all levels of matter motion is a structural feature. Without orbital motion atoms and gravitational systems have no structure.

2. The structural pattern of matter is orbital.

Atoms and gravitational systems have orbital systems. The motion pattern of particles presumably is orbital.

3. Forced motion against a body's inertia extends the length of an orbit ($F = ml$).

All motion in space is potentially orbital. Acceleration of an orbiting bodies causes it to go to a larger orbit.

4. Matter exists as a three-tier hierarchy.

In a hierarchy the units of one tier are the components of the succeeding stage. Atoms consist of particles, the masses of gravitational systems consist of atoms.

5. Particles have a photonic origin.

Before matter there was only motion in the space medium. Light and fields are motions in the space medium. Fields are produced by particles and could not have preceded them. Particles originate from prematerial source. Photons of

light or their precursors preceded particles.
No confirmed intermediates exist between photons and particles.

Dynamics is a physics of matter and energy. The conception of energy, which has been one of physics' most productive innovations, is at the same time a theory that veered physics away from a structural theory of matter. The energy concept coupled motion irrevocably with mass as the product of mass and velocity. Since it is momentum and not motion that is conserved, the conservation of energy became a pillar of physical theory. It became law as a universal principle that encompasses all forms of motion, real and potential.

Motion - not energy - makes structure. Energy is an extremely convenient abstraction for calculations involving the motion of matter and waves. The abstraction allows us to translate obscured forms of motion such as heat and work to direct numerical values. It also relates the potential for motion to positions in space. But energy associated with the motion of matter is not an entity; it has no independent existence. When the pendulum swings to and fro it doesn't alternately accumulate and expend something. It merely changes its position in space and its potential for spontaneous motion. Only light is directly related to and is synonymous with energy. Kinetic energy, therefore, is separated from its original cause by derivation through structural levels of matter. At the base of all forms of energy is the source-spring sealed in the photonic structure of particles.

Dynamics is an analytical science that is diverted from the principles of whole systems. It is a man-made science based on the parameters of intervention. Force, momentum, and inertia are all determinations of responses to imposing or obstructing the spontaneous actions of nature. Dynamics is not a true reflection of an independent universe, but instead, represents the imposition of our values on it.

The most difficult task of dynamics is to account for the structures of matter and its hierarchy. It is committed to a physics based solely on matter and its mutual interactions. Structures are regarded as a fortuitous balance of forces locked in dynamic equilibrium. All structural forms, therefore, are skeletal frames extending in a spatial void with which there is no relationship.

The Physics of Matter and Space

The physics that descends from the two-motion premise, on the other hand, is wholly causal and complete. It is a physics of matter and space. Space is a medium and there is direct interaction between it and matter by the latter's gravitational fields. Objects move spontaneously and without force under a compulsion to center themselves in a space environment made non-uniform by strong gravitational fields. It shows a fully integrated and active universe where motion and structure are inseparable. Inertia, instead of being a natural state, is the resistance to displacement of kinematic systems by an interrupting force.

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