Physics At a Glance

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The simplest definition of physics is understanding of the laws of nature.

Obviously, the laws of nature are very diverse and numerous, and each discipline has its own rules. For example, chemistry, botany, zoology, biology, etc ... each has been built on its own rules.

Physics and its laws are often associated with other natural sciences. For example, when you want to obtain information about the structure of an object, like a piece of ore or an unknown liquid, physical and chemical properties go hand in hand. Because a substance can have certain physical and chemical properties which go hand in hand. We will not discuss such interactions any further and will concentrate on the physical properties and the laws that govern it.

Man through his five senses (vision, hearing, touch, smell, and taste) is in contact with the world around him. Empirical information is transmitted from the environment to the human brain by these five senses, being processed (by human memory and intellect) and being arranged by trial (trial and error) and discovered by the cause-and-effect relationships, which ultimately results in proration of modern science and technology.

As been said, our focus in this article is physics, especially theoretical physics, and its own nature. Our knowledge of physics and theoretical physics can be divided into three distinct categories:

A) Primary group: human senses + thought and intellect + experimentation will result in empirical observed knowledge like Newtonian laws of motion.

B) The second group: human senses + thought and intellect + experimentation + conceptual theorizing with the help of own intellect like discovery of laws of light and heat and theorizing the very physical concepts behind the nature of light and heat

C) Pure theoretical or conceptual discoveries without human sensory perceptions or experimentation (and only relying on imagination, hypotheses, theories, and theorizing these concepts like the big bang theory.

The existence of phenomena within group A have been perceived by the human senses and via thoughts, intellect, sufficient experimentation, and mathematical logic has been confirmed beyond doubts. Newtonian laws of motion, the properties of a free fall in vacuum, the existence of gravity, the existence of air pressure and its various effects are clear

examples of such phenomena in which all physicists are agree upon without fundamental difference of view.

In the second group (B) of physical phenomena (perception of the human senses + thought and intellect and trial and error) some properties is gradually discovered, for example in the case of heat, men becomes aware of its laws (creation of heat - contraction and contraction of objects - laws regarding to freezing, melting and evaporation). Then via rearrangement of such empirical observation men formulate the related physical laws. Among physicists there is a complete agreement about these laws, in other words, the laws are confirmed and certain, but in part, there is a difference between the nature of the phenomena itself where theorizing and coexistence of competing theories emerge. Heat is a good example where their broad consensus on the properties but not the nature of heat itself.

The second example is light, which (human senses + thought and intellect + trial and error) knows several laws of optic such as (reflection - refraction - chemical effect on the photographic film - the passage of light through the lens and prism) and these rules are clear and specific. There is no difference of opinion about the validity of these rules and there is no difference of opinion among physicists, but there is disagreement on the nature of light itself and the reason for the refraction of light - convergence and divergence in the lens and the decomposition of light in the prism, etc. Discussions about the nature of phenomena light is controversial and from here the diverge of the theories and theorizing manifests itself. In the previous sections on heat and light we have discussed the nature of these phenomena and we invite our readers to refer to these sections.

In the third group C of physical phenomena, questions are asked for which the five senses are not involved in any way and man tries to reach a convincing answer by trying to think and get help from reason.

Historical reference: in the time of Aristotle, men did not believe that pure reason and logic had any limits and believed that all human questions and unknowns could be answered by relying on pure reason.

By plotting a historical event, we examine the ability of the human intellect alone. In ancient Greece it was believed that all matter and elements of objects on earth consisted of four elements (earth - water - air and fire) and for almost 2000 years all philosophers and scientists accepted this theory and assumed the human intellect alone was sufficient and complete to answer the question of elements. By accepting this theory, the human intellect concluded that by changing and adding these four elements to the materials in nature, various elements and materials can be made, and since the element of gold was valuable, many philosophers and scientists tried to use this fundamental assumption to turn copper or other elements into gold. In other to find the philosopher’s stone they’ve made every effort and experiment, all of which failed.

Another issue that was considered an independent and indisputable science in Aristotle's time was metaphysics, on which philosophers have been researching, fantasizing, and writing for centuries, relying on human reason alone until the great philosopher Immanuel

Kant removed metaphysics from the realm of science in his famous book Critique of Pure Reason and related it to human emotions, imaginations, and spirituality.

These examples show clearly that the intellect alone can be lost in its path to discover the scientific truth and must be provided with accurate and reliable information to come up with the right scientific explanations of the observed facts. We must admit that the ability of the human intellect is limited, and we should be very careful about our scientific explanations and must rely on empirical observations and follow the path of trial and error. I read in a physics book that if a car with a weighs of 2500 kg at a speed close to the light will collide with a (concrete) wall, municipal workers will likely collect around 6,000 kilograms of scrap iron. This is not a scientific expression but just science fiction or scientific imagination. In any case such statement or prediction is clearly out of the realm of science. The paradox of twins is another example of pseudo-science imaginations or illusion.

On the value of experimental physics and the virtue of trial-and-error process

A well-known historical statement reveals the true value of trial and error in physics. Aristotle was asked if a large rock (heavy weight) will be dropped at the same time with a smaller stone (light weight) from the same height, which one will reach the ground sooner. Aristotle replied that common sense dictates that a large rock reaches the ground in the blink of an eye and the smaller stone will hit the ground after the big rock. Today we all know the rules of free fall.

All our knowledge is within a small circle and what we do not know lays in a much larger circle, which we call the circle of unknown. Many of our questions will forever remain within this large circle of unknown.

Another historical example is astronomy (Ptolemy), who considered the earth to be the center of the universe. The human senses are not able to understand the motion of the earth and therefore it's easy for a brain with nothing more than a bare logic comes to such a conclusion. The observations of Bruno, Galileo and Copernicus corrected this mistake of human reason.

The discussion on theoretical physics can be summarized as follows: Group A consist of physical approved observations (human senses + thought & wisdom + testing). Group B regards to approved physical phenomena + experimental theories (senses + thought, wisdom & test + theorizing). And group C are based on pure theoretical phenomena (based on theorization of logical thinking and theory) with the help of intellect and thought.

Astrophysics

The night sky and the brightness of its stars have always been fascinating and mysterious to humans. To enter the discussion of astrophysics, the best thing to do is to consider the closest celestial body to the earth, namely (the moon) and its relation to the earth.

The existence of a gravitational field (gravity) has been proven for all space objects. The strength and amplitude of the gravitational field (gravity) of any celestial planet is directly proportional to its mass, and the larger the mass of a celestial body, the greater the strength and amplitude of its gravitational field (gravity). The gravitational field of any celestial body can be determined by calculating its mass.

• To better understand the interaction of earth and the moon, we assume that the moon slowly approaches the earth from a very long distance till the gravitational field (gravity) of the two bodies merges at a point which is determined by the intersection of two gravitational fields. From that specific point the moon will not be able to further approach the earth, and instead will start moving around the earth. The movement of the moons around the planets and the movement of the planets themselves around a central sun is an inevitable movement determined by the interaction of their gravitational fields.

In other words, matter and motion are always together. This matter can be an extremely small material particle of light and heat or be the moons orbiting a planet (like Jupiter) and or a total all those bodies around the sun. What can be concluded is as follows:

1. The collision of two relatively large planets in space is unlikely. If we were able to stop the movement of the moon and move it closer or farther to the earth and then release it again, the moon will return to its natural position and resume its motion.

2. A system like the solar system with all its planets is a single gravitational set that will maintain its distance from its nearest neighbor system.

3. We know for fact that the mass of celestial bodies like the earth or the moon are slowly increasing due to meteorites, so it is expected that the distance between the earth and the moon will increase after millions of years. and this rule is predictable for all planets.

4. The orbital motion around the central sun is an intrinsic and spontaneous motion of matter and is fundamentally different from a forced acerated motion of a projectile (like an artificial moon) and can correct its own orbital path.

5. In the case of our own solar system, the ratio of the mass of the planets to the mass of the sun and their distance from the sun is observed and is in line of expectation. The smallest planet Mercury has the least distance with the sun, then we have Venus which is smaller than Earth but larger than Mercury. Then we have the Earth and its moon. We have then Mars which, although smaller than Earth, is farther from the Sun. But why? Certainly, there is a scientific explanation which we are unaware of and put it in the “circle of the unknowns”. The position of the asteroid belt arises the same question. We must admit that the answer again lay in the circle of the unknowns.

6. Space objects, such as the Earth and the Moon, each have a gravitational field (gravity) much larger than their central core, and gradually, by moving away from the central core of this gravitational field (gravity) becomes weaker. In astrophysics, the gravitational field of any space object is known in relation to the existence of particles called gravitons, the existence of which is not comprehend with our senses except indirectly with the effects of gravity. Gravitons are regulating the distances of planets and planetary systems, but our knowledge is fairly limited around Gravitons.

What is space?

We start with a simple example to discuss the existence of space. Think of a simple balloon. It opens according to the volume of incoming air, which is proportional to the volume of air inside it. When we enter more air, the space inside the balloon opens more. So, the space inside the balloon is proportional to the amount of material inside.

Now suppose we have a balloon that can be opened indefinitely, and we put the earth inside it. This balloon will open as much as the volume of the earth plus the volume of its gravitational field (gravity). The interior of our hypothetical balloon will be the volume of the Earth's central core plus the volume of its gravitational field occupied by particles (gravitons), which is hundreds of times the original volume of the Earth.

With this view of the universe and the knowledge that billions of galaxies have been detected in the universe, space can be given a different definition.

Space is the product of all space objects and their gravitational field, which extends to the farthest corners of the universe. The simplest conclusion to be drawn from this definition is that an absolute vacuum (free of any Graviton particle) at any point in the universe, is physically meaningless.

What I believe about astrophysics is based on the observations and research of astronomers. Our judgment of the relationship among planetary systems and galaxies is purely theoretical and remain within group C of physical knowledge. It's a product of theorizing and human imagination and intellect.

The origin of the world,
the beginning and the end of the world, we are unaware of,
the first and last chapter of this ancient book is forgotten.

The origin of the universe has always been tempting and questionable for human beings, and according to a human habit, every phenomenon has a starting point and an end point. And in this case too, the human brain is looking for a starting point: the origin of the universe.

Society, with its religious beliefs, accepts and is satisfied with its interpretations and religious explanations of the origin of the universe, but scientists are always looking for an explainable scientific argument.

The most important theory in this regard is the Big Bang, which occurred (8.9) billion years ago, followed by the cosmology of the universe, in which galaxies are still moving faster than the speed of light. The Big Bang theory and its logical coherence of the universe from zero to hundred is not consistent with any known scientific phenomenon and is not acceptable.

We examine the major drawbacks of this theory in a few cases. In the world we live in, matter is by no means produced spontaneously or destroyed, and its quantity is constant in nature (the principle of conservation of matter) while the Big Bang theory claims that a particle thousands of times smaller than an atom starts to grow, and ultimately after the big bang event, forms the matter that covers billions of galaxies.

It also falls short to explain the existence of the space required before the Big Bang event. Because the existence of an absolute vacuum space without mass is an absurd physical phenomenon and highly improbable. Many astronomers believe that our known universe could be just a tiny part of a much larger universe whose origin is unknown to us.

The expanding universe with a speed higher than speed of light is contradictory with Einstein's theory that if matter travels at the speed of light, its mass is infinitely close. Neither of these two theories can be defended. I would like to illustrate my own theory on the existence of the universe, which is very different from the Big Bang theory.

It starts with the statement that the universe contains a very large amount of total mass which is almost impossible to calculate.

And let us recognize and use the two sentences “I do not know” and “we do not know” in response to the question of how this huge amount of matter was created and where it came from. We have talked about the fact that the known scientific knowledge of man relies within a small circle and our scientific ignorance forms a much large circle around it. The true confession of “I do not know, or we do not know” is not a disgrace to the scientific dignity of man, it is merely a necessity to accept the facts as they are and admit our inability to find out the roots of many issues. Knowing that we must step forward and express our pure theories and theoretical explanations, and that would always remain challenging.

A different theory from the Big Bang is that if we were able to go back in time, we would have been witnessing the same universe forever. It has always existed in this form and structure, and if we could follow the changes in the universe from 200 billion years ago to today, we could witness a gradual movement of new systems with creation and extinction of celestial bodies, systems, and galaxies. New suns come to existence all the time and the ancient one extinct one way of other.

With a simple example, we can recreate and imagine the emergence of a new system in our minds. Planet Jupiter and its moons can be such an imaginary isolated celestial system, which is being fed continuously by large meteors. The existence of and these meteors cannot be assigned only to the solar system. They should exist all over the universe and therefore all space objects (suns and planets) are fed by these small and large meteorites. Which means that enormous masses are added to any celestial system in the known universe.
The origin of these meteorites, which are flooding the celestial spheres, must be included in the same (I do not know, and we do not know) category.

Let's go back to our own small system (Jupiter and its moons) which by addition of enormous mass by falling meteors after billions of years, the mass of Jupiter's moons increases, and therefore their distance from each other increases (by distance, mass, and gravitational field equation).

At the core of Jupiter, the planet's core, over billions of years and the emergence of thousands of meteor storms, Jupiter increases gradually its volume and mass by a multiple large number, and the resulting centrifugal pressure transforms Jupiter into a full-fledged sun with ultimately its own independent system. We must note that time, for the universe, seems very different from our fast perception of time.

On origins of life on Earth

The origins and beginnings of life on Earth and the evolution of plant and animal life have always been of interest to scientists from astronomers to the biologists.

We must consider that there is no logical justification to limit the existence of life to the planet Earth. Anywhere in the universe, when the living conditions, including water, oxygen, and light are adequate, life can emerge and begin to function. This belief is completely justifiable and acceptable. For example, phytoplankton which are plants, and zooplankton which are animals, live in a variety of see and fresh water and reproduce by photosynthesis, providing food chain for other organisms.

Another remarkable fact is that many unicellular or microscopic organisms do not perish under unfavorable conditions. They do not die and take on a resilient state until they are provided with suitable conditions for life and reproduction.

It can be accepted that annually thousands upon thousands of these resistant protozoa and microscopic creatures resistant to storms and other harsh conditions blow out of the Earth's atmosphere and can embark on a journey of thousands of years or more into space. And if they land in a suitable place to live, they will regain their activity.

Undoubtedly, millions of years ago, when the conditions our Earth became conducive to growth and the beginning of life, such unicellular or microscopic travelers at the time enter the Earth's atmosphere into the oceans in the same way as mentioned earlier. The gradual

evolution of single-celled organisms into advanced creatures have been well traced explained by the biologists.