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Commentary

Comments on “Frontier experiments: Tough science- Five experiments as hard as finding the Higgs”

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The five frontier experiments published in Nature are commented item by item: spotting distant signs of life, seeing through the molecular mirror, looking for extra dimensions, catching a gravity wave, redefining the kilogram. It is concluded that the first two experiments are great ideals that are impossible to realize in recent years, the last three are false theories pulling physics into morass.

Key words: Nature, distant signs of life, molecular mirror, extra dimensions, gravity wave, kilogram.

INTRODUCTION

Nature published Jones (2012) paper “Frontier experiments: Tough science- Five experiments as hard as finding the Higgs”, introduces five frontier experiments: (1) spotting distant signs of life, (2) seeing through the molecular mirror, (3) looking for extra dimensions, (4) catching a gravity wave, (5) redefining the kilogram. Now these are comments on them item by item.

SPOTTING DISTANT SIGNS OF LIFE

The search for extraterrestrial life has always been engaged in the exploration, and never stopped. It is more difficult than to find a needle in a haystack, the probability of zero probability events. It cannot be confirmed in many many years.

SEEING THROUGH THE MOLECULAR MIRROR

“They need to build extremely high-resolution spectrometers to measure the energy levels of chiral molecules. Their best instrument to date can discern energy differences as small as 5 parts in 1014 — about a million times better than the resolution of an off-the-shelf spectrometer” (Jones, 2012). It is impossible to improve the resolution by a million times in recent years.

LOOKING FOR EXTRA DIMENSIONS

“It is an aspect of reality so fundamental that most us cannot imagine anything different: the world has precisely three spatial dimensions — left–right, forwards–backwards and up–down. But superstring theory and other attempts to devise a ‘theory of everything’ have led many physicists to propose that space has many more than that. These extra dimensions would presumably be curled up very tightly, and thus hidden from everyday experience. But they would affect gravity at very small scales, producing a force between two masses that differs ever so slightly from that predicted by Newton’s classical law of gravity. An experiment able to detect changes in gravity at that scale might therefore be able to ‘see’ any other dimensions” (Jones, 2012).

The physical space is three-dimensional, isotropic, and there are no four-dimensional or any higher-dimensional spaces that exist (Li et al., 2007a, b). Multidimensional (more than 3-D) physical space theory has always been fallacy. Experimental measurement is impossible. These experiments being interpreted as the support of multi-dimensional space are experimental and theatrical errors.

In mathematics, each multi-dimensional variable can be called a multi-dimensional space. In physics, there are one-dimensional space (line), two-dimensional space

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(surface), and three-dimensional space (cube); but there is not any physical space of more than three-dimensional. Multidimensional space in mathematics cannot be transplanted directly to physics. But only when the number of dimensions is fewer than or equal to 3 (time not included), a correspondence exists (Li et al., 2007b).

CATCHING A GRAVITY WAVE

"Scott Ransom and others try to detect one of the most fundamental predictions of Einstein's general theory of relativity: gravitational waves. "It will open a whole new window on our Universe," he exclaims. "We will be able to see with mass instead of light." According to Einstein, gravity waves are ripples in the fabric of space-time caused by the movement of mass — an orbiting pair of neutron stars, for example. It is just like jiggling an electron, which causes ripples in the surrounding electric and magnetic fields to spread out as light and other forms of radiation. "When you jiggle something massive," he says, "you give off gravitational waves"" (Jones, 2012).

Gravity is an equivalent expression for momentum exchange between objects and microparticles, generating the force on the line of centers of the two objects, and pushing them together (Li, 2011b). The universal attraction formula that is proportional to two objects masses multiplied together, and inversely proportional to the square of their distance apart, is derived (Li, 2011b). Gravitons and gravitational waves do not exist. Interaction between objects have always existed, there is no gravitational waves. When you jiggle something massive, you disturb the flow of microparticles, and do not give off gravitational waves. To catch a gravity wave is impossible.

REDEFINING THE KILOGRAM

"The basic idea is to pin the kilogram to a precisely measured fundamental physical constant, in much the same way that the meter is now defined in terms of the speed of light in a vacuum: it is the distance that light travels in precisely 1/299,792,458 s. To do this for the kilogram would mean fixing Planck's constant, h, which reflects the size of energy quanta in quantum mechanics and is famously linked to energy through the frequency of light: E = hν. Combining that equation with the even more famous $E = mc^2$ then leads to a definition of mass" (Jones, 2012).

There are two questions in the definition of the meter in terms of the speed of light in a vacuum: (1) the speed of light in a vacuum is an absolute constant, or a speed range, or others, still not sure (Li, 2010); (2) even if the speed of light in a vacuum is an absolute constant, the vast majority of people still cannot characterize the distance traveled by light moving in a vacuum in precisely 1/299,792,458 s. Thus, it does not have much practical value to define meter by the speed of light in a vacuum. Although the meter in the International Bureau of Weights and Measures (BIMP), Paris, France, changes with the environment and the time extremely tiny, it is easy to use. When using the meter in the International Bureau of Weights and Measures to define meter, there is only once error; whereas when using the light speed and time to define meter, there are twice errors.

First, if defining the kilogram according to the article (Jones, 2012) using wrong $E = mc^2$ (Li, 2007, 2008; Li et al., 2007a), will lead to the mistake of connotation. The special relativity is wrong (Li, 2008). Mass is one of the materials' essential attributes, the quantity an object contains. Energy is a status attribute of materials' motion (Li et al., 2007b). Mass is mass, energy is energy; mass cannot be transformed into energy and energy cannot be transformed into mass (Li, 2007). $E_k=mv^2/2$ means that an object with mass m moving with velocity v has kinetic energy E_k, not meaning that mass m disappear and kinetic energy E_k created. Second, using the kilogram in the International Bureau of Weights and Measures to define the kilogram, there is only once error; whereas using the $E = mc^2$ to define the kilogram, there are twice errors. Third, there is hardly anyone that can tell how much energy is in an object.

Conclusion

The first two experiments are great ideals that are impossible to realize in recent years, the last three are false theories pulling physics into morass.

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