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

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Abstract: 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

Nature published Nicola Jones paper "Frontier experiments: Tough science- Five experiments as hard as finding the Higgs"[1], 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 comments on them item by item.

1. Spotting distant signs of life

The search for extraterrestrial life has been always 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.

2. 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." It is impossible to improve the resolution by a million times in recent years.

3. Looking for extra dimensions

Physical space is originally three-dimensional [2]. Multidimensional (more than 3-D) space theory has always been fallacy. Experimental measurement is impossible.

4. Catching a gravity wave

Gravity is the equivalent expression of the momentum [3]. Graviton does not exist. Interaction between objects have been always exits, there is no gravitational waves. To catch a gravity wave is impossible.

5. 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's the distance that light travels in precisely 1/299,792,458 seconds. 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 = mc2 then leads to a definition of mass."

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, still not sure [4]; (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 seconds. 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, but it is easy to use.

If defining the kilogram according to the article [1] using wrong $E = mc^2$ [5-8], will lead to the connotation of error.

In summary, 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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