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Problems on the Gravitational Wave and the Repulsive Gravitation

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Abstract

It is exciting that the gravitational wave has been confirmed, according to the announcement of LIGO. This would be the time to fix the Einstein equation for the gravitational wave and the nonexistence of the dynamic solution. As a first step, theorists should improve their pure mathematics on non-linear mathematics and related physical considerations beyond Einstein. Then, it is time to rectify the Einstein equation that has no gravitational wave solution which Einstein has recognized, and no dynamic solution that Einstein failed to see. A problem is that physicists in LIGO did not know their shortcomings. Also, in view of the far distance of the sources, it is very questionable that the physicists can determine they are from black holes. Moreover, since the repulsive gravitation can also generate a gravitational wave, the problem of gravitational wave is actually far more complicated than we have known. A useful feature of the gravitational wave based on repulsive gravitation is that it can be easily generated on earth. Thus this can be a new tool for communication because it can penetrate any medium.

KEYWORDS

anti-gravity coupling; gravitational radiation; repulsive gravitation; principle of causality.

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1. INTRODUCTION

The LIGO announced that gravitational wave has been detected [1]. Congratulations to those who worked hard for this achievement. In the announcement, it is claimed that Einstein's prediction on the gravitational wave has been fulfilled. However, this is not an accurate story of Einstein on this subject. Although, based on the linearization of his equation, Einstein had predicted the existence of the gravitational wave, later he was also the first to discover that his non-linear field equation has no gravitational wave solution [2, 3].

In fact, Einstein concluded his talk on gravitational waves at Princeton University by saying [4] “If you ask me whether there are gravitational waves or not, I must answer that I do not know. But it is a highly interesting problem.” Thus, Einstein's last words on this subject was that "I do not know." Obviously, Einstein was puzzled by why his linearized equation predicted the existence of the gravitational solutions, but his non-linear Einstein equation rejects such a claim. Now, it is time to rectify the Einstein equation to fix such a problem.

Moreover, in general relativity mass is not the only source of gravitation, [1] since it has been shown, for instance, that the electromagnetic energy can be the source of the repulsive gravitation [5]. In this paper, we shall discuss also the gravitational wave generated by electromagnetic energy and its applications.

2. GRAVITATIONAL WAVES AND THE LORENTZ-LEVI-EINSTEIN EQUATION

Einstein did not know that linearization of the Einstein equation is not valid for the dynamic case to obtain an approximate solution although it is valid for the static case [6]. Einstein implicitly, but incorrectly assumed that linearization was always valid to obtain an approximate solution for the nonlinear field equation [6].

However, these facts are absent from the announcement, and this would probably indicate that those working on the gravitational waves, do not fully understand Einstein's theory. In the announcement of LIGO, it is presented as if that Einstein had not have any doubt on the gravitational wave. If they present the truth, they must address the problem why Einstein was in doubt. This is apparently beyond those working for LIGO. In fact, they even have not fully understood Einstein's theory.

They probably do not know that the linearized equation is a valid linearization to obtain an approximate solution only for the Lorentz- Levy- Einstein equation [7],

$$G_{\mu\nu} \equiv R_{\mu\nu} - \frac{1}{2} g_{\mu\nu} R = - K [T(m)_{\mu\nu} - t(g)_{\mu\nu}], \quad (1)$$

where $t(g)_{ij}$ is the energy-stress tensors for gravity and is of the first order in K. However, the linearized equation is actually unrelated to the Einstein equation [6], which has no bounded dynamic solution [8, 9].

From Eq. (1), it is clear the physical reason that the Einstein equation does not have a dynamic solution is due a violation of the principle of causality [10], when $t(g)_{ij}$ is absent from the source. Moreover, although Einstein realized that his equation does not have the gravitational wave solution, he did not see that the problem of the gravitational wave and the non-existence of the dynamic solution of his equation are inextricably related [6, 7].

Historically, Einstein & Rosen [2] could be considered as the first to discover the non-existence of wave solutions, but editors of the Physical Review found that the singularities they discovered are removable [11]. The editors of the Physical Review accepted unbounded solutions as valid, [2] and thus led to a self-deceptive satisfaction that hindered progress in physics [12]. The editors of journals such as the Physical Review D, the Royal Society Proceedings A and etc. did not recognize this violation of physical principles because they did not understand the principle of causality [7, 10, 13, 14]. Moreover, due to some elementary errors in mathematics [15, 16] [3], Christodoulou & Klainerman [17] claimed to have constructed dynamic solutions for the Einstein equation. They actually failed to show that the dynamic solutions is not an empty set.

A root of these problems is due to that physical space-time coordinates are ambiguous in Einstein's theory. Such an ambiguity is a consequence of Einstein's theoretical errors on measurements [18, 19]. The correct criticisms of Whitehead [20] and Zhou [21] were not accepted since they had not provided a solid theoretical foundation for general relativity to explain impressive observational confirmations. Although the physical meaning of the space-time coordinates has been clarified recently [10, 18, 21, 22], the existing conceptual problems still seem to grasp many theorists. Fortunately, the analysis on plane-waves initiated by Liu & Zhou [14, 23] would give a simple illustration of the non-existence of the wave solution.

Currently many physicists, including Einstein, regarded gravitation is simply a branch of Riemannian geometry This is simply incorrect. Since there are gravitational radiations in general relativity, the radiation reaction force must be included. However, there is no radiation reaction force from the geodesic equation, the equation of motion of general relativity [7]. Thus, it is clear that general relativity needs a fundamental rectification.

Another serious mistake of Einstein is his speculation of $E = mc^2$ as unconditionally valid [24] although he failed to prove it [25]. This leads to his overlooking the repulsive gravitation generated by non-massive sources.

3. THE REPULSIVE GRAVITATION GENERATED BY ELECROMAG-NETISM

The repulsive gravitation should have been discovered long time ago from the metric of a charged particle [5]. It should have been discovered as early as 1916. From a solution of the static Einstein equation for a charged particle Q, with mass M and charge q, the Reissner-Nordstrom metric [26] is as follows:

$$ds^2 = \left(1 - \frac{2M}{r} + \frac{q^2}{r^2}\right)dt^2 - \left(1 - \frac{2M}{r} + \frac{q^2}{r^2}\right)^{-1} dr^2 - r^2 d\Omega^2 , \qquad (2)$$

(with c = 1) where r is the radial distance (in terms of the Euclidean-like structure [18]) from the particle center. In metric (2), the gravitational components generated by electricity have not only a different radial coordinate dependence but also a different sign that makes it a new repulsive gravitation in general relativity.

However, owing to the belief that the electric energy had a mass equivalence, [4] theorists including Einstein, and t' Hooft [27] consider the mass *M* would include the electric energy. Then, the net effect is that there would be no repulsive gravitation from a charged ball. Nevertheless, Tsipenyuk & Andreev [28] observed a weight reduction of a charged metal ball. Thus, the existence of repulsive gravitation is confirmed by experiments.

4. THE CHARGE-MASS REPULSIVE FORCE AND UNIFICATION

Another problem for the existence of the repulsive gravitation in the Reissner-Nordstrom metric is that it makes clear that general relativity is incomplete [5]. To show the static repulsive effect of a charged particle, one needs to consider only g_{tt} in metric (2). According to Einstein [29], the equation of motion is the geodesic equation. For a test particle *P* with mass m at **r**, the force on *P* is

$$(-m\frac{M}{r^2} + m\frac{q^2}{r^3})\,\hat{r} \qquad \text{where} \quad \hat{r} \quad \text{is a unit vector} \qquad (3)$$

in the first order approximation because $g^{rr} \cong -1$. (One need not worry whether the gauge is physically valid because the gauge affects only the second order approximation of g_{tt} [30].) Thus, the second term is a repulsive force.

If the particles are at rest, then the force generated by p acting on the charged particle *Q* would be

$$(m\frac{M}{r^2} - m\frac{q^2}{r^3})\,\hat{r}\ , \text{where} \quad \hat{r} \quad \text{is a unit vector} \qquad (4)$$

because the action and reaction forces are equal and in the opposite directions. However, for the motion of the charged particle with mass M, if one calculates the metric according to the particle *P* of mass m, only the first term is obtained. Thus, the geodesic equation is inadequate to be the equation of motion.

It is necessary to have a repulsive force with the coupling q^2 to the particle *Q* in a gravitational field generated by masses. Thus, force (4) to particle *Q* is beyond the theoretical framework of gravitation + electromagnetism. In other words, as predicted by Lo, Goldstein, & Napier [31], general relativity leads to a realization of the inadequacy of general relativity, just as electricity and magnetism lead to their shortcomings.

The charge-mass repulsive force mq^2/r^3 for two point-like particles is inversely proportional to the cube power (instead of the square) of the distances between the two particles. This would mean that such a repulsive force would diminish faster than gravity at long distance. [5] Moreover, this force is proportional to the square of the charge q, and thus is independent of the charge sign. These would make the repulsive effects verifiable [32].

The term of repulsive force in metric (2) comes from the electric energy [24]. An immediate question would be whether such a charge-mass repulsive force mq^2/r^3 is subjected to electromagnetic screening. It is conjectured that this force, being independent of a charge sign, would not be subjected to such a screening although it would be in general relativity. Also, this force can be considered as a result of a field created by the mass m and the field interacts with the q^2 (see next section). Thus such a field is independent of the electromagnetic field.

5. EXTENSION OF EINSTEIN'S EQUIVALENCE PRINCIPLE & THE FIVE-DIMENSIONAL RELATIVITY

If we consider the coupling with q^2, this naturally leads to a theory of five-dimensional space of Lo, Goldstein and Napier [31]. However, the five-dimensional theory of Kaluza [33] and Einstein and Pauli [34] are excluded because they do not have the coupling with the square of a charge since the "extra" metric elements are neglected

One may ask what the physical meaning of the fifth dimension is. The position of Lo. Goldstein and Napier [31] is that the physical meaning of the fifth dimension is not yet very clear, except some physical meaning is given in the equation, $dx^5/d\tau = q/Mc^2K$ where M and q are respectively the mass and charge of a test particle, and *K* is a constant. This equation relates the fifth variable x^5 to τ.

The fifth dimension is assumed [31] as part of the physical reality, and the metric signature is (+, **–**, **–**, **–**, **–**). We shall denote the fifth axis as the w-axis (w stands for "wunderbar", in memorial of Kaluza), and thus the coordinates are (t, w, x, y, z). Our approach is to find out the full meaning of the w-axis as our understanding gets deeper.

For a static case, we have the forces on the charged particle *Q* in the ρ -direction (ρ start from the center of p)

$$-\frac{mM}{\rho^2} \approx \frac{Mc^2}{2}\frac{\partial g_{tt}}{\partial \rho}\frac{dct}{d\tau}\frac{dct}{d\tau}g^{\rho\rho}, \quad \text{and} \quad \frac{mq^2}{\rho^3} \approx -\Gamma_{\rho,55}\frac{1}{K^2}\frac{q^2}{Mc^2}g^{\rho\rho} \qquad (5a)$$

and

$$\Gamma_{k,55}\frac{q}{KMc^2}\frac{dx^k}{d\tau} = 0, \quad \text{where} \quad \Gamma_{k,55} \equiv \frac{\partial g_{k5}}{\partial x^5} - \frac{1}{2}\frac{\partial g_{55}}{\partial x^k} = -\frac{1}{2}\frac{\partial g_{55}}{\partial x^k} \qquad (5b)$$

in the (*-r)*-direction. The meaning of (5b) is the energy momentum conservation. It is interesting that the same force would come from a different type of metric element depending on the test particle used. Thus,

$$g_{tt} = 1 - \frac{2m}{\rho c^2}, \quad \text{and} \quad g_{55} = \frac{mMc^2}{\rho^2}K^2 + \text{constant}。 \qquad (6)$$

In other words, g_{55} is a repulsive potential. Because g_{55} depends on *M*, it is a function of local property, and this is different from the metric element $g_{t\,t}$ that depends on a distant source of mass m. Thus, this force, though acting on a charged particle, would penetrate electromagnetic screening.

Note that from the above, it is possible that a charge-mass repulsive potential would exist for a metric based on the mass *M* of the charged particle *Q*. However, because *P* is neutral, there is no charge-mass repulsion force on *P*.

That the repulsive gravitational potential can be generated from a mass, would explain the fact that a charged capacitor can also have the repulsive force [32], but such a force is absent [6] from the current four-dimensional theory. This is why many would not accept the existence of the repulsive gravitation in spite of clear evidence.

6. THE CHARGE-MASS INTERACTION AND THE REDUCTION OF WEIGHT

It is found that a charge may generate a gravitational static field that repulses a mass [24]. Since the discovery and the prediction are based on general relativity, Einstein's theory would have another important confirmation to be verified [24]. Thus, there is a new neutral charge-mass interaction that is beyond electromagnetism and gravitation, and thus as shown Einstein's unification is a necessity [24].

Moreover, since this force is independent of the charge sign, it should not be subjected to electromagnetic screening. Nevertheless, such a coupling exists in the five-dimensional theory of Lo, Goldstein and Napier [31]. Their theory would support that such a neutral force is not subjected to electromagnetic screening. It thus follows that the existence of this static neutral repulsive force can be tested by weighing a charged capacitor to see whether its weight is reduced [5]. The charge-mass interaction is very weak, but its collective effect can be measured [35].

The existence of such a force on a capacitor was first verified by Liu [5] [7] although the weight reduction of charged capacitors has been found much earlier [36]. (Because the weight reduction was measured from a flat capacitor, the weight reduction was incorrectly attributed to be related to the direction of the electric field [5].) Thus, a weight reduction of

a neutral object may not be due to a reduction of mass, but a neutral repulsive force, which was unknown to Galileo, Newton, and Einstein [37].

Some physicists considered the weight reduction is due to a reduction of mass [38, 39]. However, one can show experimentally the mass is still essentially the same. This can be done by measuring the period of a pendulum [37]. The period will not changed if the mass is reduced. However, the period will be extended if the weight is reduced.

7. THE CURRENT-MASS INTERACTION AND THE REPULSIVE GRAVITATIONAL WAVE

If the electric energy leads to a repulsive force toward a mass, according to general relativity, the magnetic energy would lead to an attractive force from a current toward a mass [40]. The existence of such a current-mass attractive force has been verified by Martin Tajmar and Clovis de Matos [41] from the European Space Agency. They found that a spinning ring of superconducting material increases its weight much more than expected. Thus, they incorrectly believed that general relativity had been proven wrong. However, according to quantum theory, spinning superconductors should produce a weak magnetic field. Thus, they are also measuring the interaction between an electric current and the earth.

The existence of the current-mass attractive force would solve a puzzle, i.e., why a charged capacitor exhibits the charge-mass repulsive force since a charged capacitor has no additional electric charges? In a normal situation, the charge-mass repulsive force would be cancelled by other forms of the current-mass force as Galileo, Newton and Einstein implicitly assumed. This general force would be related to the static charge-mass repulsive force in a way similar to the Lorentz force is related to the Coulomb force.

One may ask what is the formula for the current-mass force? However, unlike the static charge-mass repulsive force, this general force would be beyond general relativity since a current-mass interaction would involve the acceleration of a charge, this force would be time-dependent and generates electromagnetic radiation. Moreover, when the radiation is involved, the radiation reaction force and the variable of the fifth dimension must be considered [31]. Thus, we are not ready to derive the current-mass interaction yet.

Nevertheless, we may assume that, for a charged capacitor, the resulting force is the interaction of net macroscopic charges with the mass. Experimentally, we have found that the weight reduction is proportional to the square of the potential difference in the capacitor. Thus, we can generate a repulsive gravitational wave by applying an alternative electric potential to a capacitor.

8. WEIGHT REDUCTION BY HEAT

This current-mass interaction also explains a phenomenon, which is also reported by Liu [5] that it takes time for a capacitor to recover its weight after being discharged. A discharged capacitor needs time to dissipate the heat generated by discharging. Then, the motion of its charges would recover to normal.

Thus, it should be expected that the heated metals would reduce their weight [42]. It is conjectured that the heat would additionally convert some orbital electrons to random motion, but the increased mass due to heat energy is negligible as Einstein [43] pointed out. If this explanation of weight reduction is valid, then a metal would reduce its weight as the temperature increases. This should be further tested experimentally.

Moreover, since a heated metal is a solid, one can in principle test its mass by acceleration. (Another way to do this is to compare the periods of a pendulum before and after the metal is heated.) One can also verify the existence of the repulsive gravitation by measuring the reduction of attractive gravitation by using a torsion balance scale after the metal is heated.[8] Considering the repulsive gravitational wave, the problem of gravitational wave is complicated.

9. DISCUSSION AND CONCLUSIONS

It is hoped that the confirmation of the gravitational wave would give an added impetus for recognizing the severe problems in theories of gravitational waves and the non-existence of dynamic solutions. Since Einstein's puzzle is due to his inadequacy in non-nonlinear mathematics, as a first step, theorists should improve their understanding in non-linear mathematics. Moreover, it is urgently needed to investigate what is the exact equation for the gravitational wave and the dynamic solutions because in the Lorentz-Levy-Einstein equation the exact form of the gravitational energy-stress tensor $t(g)_{\mu\nu}$ is still not known. Moreover, since the Einstein equation is not valid for the dynamic case, there is no theoretical basis for the existence of a black hole.

A common mistake among those who work on the gravitational wave is that they have incorrectly believed that the linearized equation would give an approximate solution of the non-linear Einstein equation. The fact is, however, that the linearized equation and the non-linear Einstein equation are independent equations. For example, in general relativity, there is no two-body bounded solution [44] although there are two-body solutions in Newtonian theory. Thus, it is incorrect to claimed that general relativity has superseded Newtonian theory.

Moreover, in view of that the source of the gravitational wave is so far away, it is questionable that the physicists can determine the sources are black holes. It seems that such a claim shows only an inadequate understanding of Einstein's theory. Considering the repulsive gravitational wave, the problem of gravitational wave is far more complicated. However, many physicists are so involved in current theoretical considerations they seem to forget that physics is based on experiments.

One might argue that the electromagnetic energy is equivalent to mass since the π_0 meson can decay into two photons. However, this evidence only means that the photons contain non-electromagnetic energy. In fact, general relativity implies that the photons consist of the electromagnetic energy and the gravitational energy [45, 46]. *Moreover, the formula $E = mc^2$ is inconsistent with the static Einstein equation because the electromagnetic energy-stress tensor cannot affect the Ricci curvature R in the Einstein equation; whereas a mass can.*

Currently, the mathematics of many physicists is so poor that they are not aware that there is a problem in Einstein's theory on the gravitational wave [47]. This is evident since well-known theorists such as the Wheeler School, the Wald School, etc. all made errors in this issue [48, 49]. The Wheeler School made the invalid claim on the existence of gravitational wave solutions because they have made crucial errors in undergraduate calculus [48]. Wald has claimed the existence of the second order solutions, but has never provided one [49]. Christodoulou & Klainerman [17] actually have not completed the construction of any dynamic solutions [15].

These errors were not discovered before it is proven in 1995 that the Einstein equation actually has no dynamic solution [14, 50]. This is so because the misleading positive mass theorem of Schoen and Yau [51] and the positive energy theorem of Witten [52] had made many physicists had the false confidence that Einstein's theory is consistent and the Einstein equation has stable dynamic solutions [53]. Many physicists are glad that a good mathematician such Yau had come out to help removing the doubt caused by Gullstrand [54].

Few realized that a mathematical theorem is at most as good as its assumptions. However, Yau's assumption has implicitly excluded all the dynamic solution, and thus his theorem is actually misleading [53]. Nevertheless, Yau failed to see this because he only relies his faith on Einstein but has never attempted to obtain a dynamic solution.

Moreover, the 2016 APS Medal for exceptional achievement in research was awarded to Edward Witten of the Institute for Advanced Study. However, upon close examination, it is only for his “discoveries in the mathematical structure of quantum physics”. It is clear also that the claimed Witten’s achievements have no experimental supports since it is known that both quantum gravity and string theory have no experimentally verifiable results. I was puzzled that such an award in physics actually does not have any achievement supported by experiments [55]. Thus, this is indeed an exceptional award in Galileo's standard for an achievement in physics. It should be noted that in string theory, the defective Einstein equation is derived, and thus there are errors in current string theory on which Witten is a leader.

Witten was graduated in history, and his understanding of pure mathematics is at most half-baked because he did not have a formal education in pure mathematics. [9] Due to inadequacy in pure mathematics like many physicists such as Pauli [56], Witten also does not understand Einstein's equivalence principle (see Appendix), and thus agrees with the misinterpretation of Wheeler [26, 48]. He also does not know that the Einstein equation does not have any dynamic solution [8, 9] because he believed incorrectly that linearization of the Einstein equation always produces an approximate solution for the Einstein equation [6]. Thus, he also failed to see that there is no bounded two-body solution in general relativity [44].

Another problem is that Witten also failed to see the existence repulsive gravitation [5, 2] and thus misled the developments of the string theory. However, most of the APS members also did not know this problem.

Witten [52] adapted Yau's invalid view [51] based on the invalidly assumed existence of dynamic solutions for the Einstein equation, and thus proved another version of the misleading theorem on energy. Yau's positive mass theorem had delayed the progress of general relativity at least for 13 years until 1995 [14, 50]. [10] However, because the mathematicians in charge still do not understand physics [53], Witten was also awarded the Fields Medal in 1990.

As a result, the 1993 Nobel Committee changed its mind [57] and incorrectly claimed the existence of a dynamic solution [58] and rejected Einstein's equivalence principle. Thus, APS Medal of exceptional achievement awarded to Witten is highly inappropriate because it would made the situation worse. A merit of this award is, however, exposing the shortcomings in mathematics and physics of the Selection Committee of APS. This would help to recover the honor of Gullstrand [54], Chairman of the Nobel Prize Committee for Physics.

According to Dr. D. Kulp, there is no editor in American Physical Society (APS), who has a background in pure mathematics. Unfortunately, both physicists and mathematicians all made errors in relativity. In view of this, the hope that APS would settle the current problems shortly is rather unrealistic since it would take time to educate the physicists. Thus, the area of gravitation, the Unite States is unfortunately behind the Russian. An urgent tasks is to find the exact equation for the wave solutions and the dynamic solutions.

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Appendix: Mathematical Foundation of Einstein’s Equivalence Principle

A source of confusion is that Pauli’s invalid version [56] has been mistaken as Einstein’s equivalence principle although Einstein has made clear it is a misinterpretation [59]. In this Appendix, this errors are pointed out in the hope to help those who do not have an adequate pure mathematics background.

In "Gravitation" [26] of Misner, Thorne and Wheeler, there is no reference to Einstein's equivalence principle. Instead, they misleadingly refer to Einstein's invalid 1911 assumption [60] and Pauli's invalid version [56]. In addition, in their Eq. (40.14), Misner et al. [26] even failed to understand the local time of a particle at free fall.

The mathematical theorems [61] related to Einstein's equivalence principle are as follows:

Theorem 1. Given any point *P* in any Lorentz manifold (whose metric signature is the same as a Minkowski space) there always exist coordinate systems (x^{μ}) in which $\partial g_{\mu\nu}/\partial x^{\lambda} = 0$ at *P*.

Theorem 2. Given any time-like geodesic curve Γ there always exists a coordinate system (the so-called Fermi coordinates) (x^{μ}) in which $\partial g_{\mu\nu}/\partial x^{\lambda} = 0$ along Γ.

In these theorems, the local space of a particle is locally constant, but not necessarily Minkowski.

However, after some algebra, a local Minkowski metric exists at any given point and along any time-like geodesic curve Γ. In a uniformly accelerated frame, the local space in a free fall is a Minkowski space according to special relativity. What Einstein added is that such a locally constant metric must be Minkowski. This is the basis of the Einstein-Minkowski condition that Einstein uses to derive the gravitational redshifts [29].

Note that, Pauli's version [56] is a simplified but corrupted version of these theorems as follows:

> "For every infinitely small world region (i.e. a world region which is so small that the space- and time-variation of gravity can be neglected in it) there always exists a coordinate system K_0 (X_1, X_2, X_3, X_4) in which gravitation has no influence either in the motion of particles or any physical process."

Pauli regards the equivalence principle as merely the existence of locally constant spaces. Moreover, a local Minkowski space at a point does not mean the existence of local Minkowski spaces at a small world region.

An error is that Pauli extended the removal of uniform gravity to the removal of gravity in a small region. This is simply incorrect in mathematics, but he does not see the difference because of inadequacy in mathematical analysis. He did not recognize that the removal of gravity in a small region, no matter how small, would be very different from a removal of gravity at one point. Apparently, neither Pauli [56], Witten [52] nor the Wheeler School [26] understands the mathematics of the above theorems [61].

Endnotes:

1) For instance, Professor Hughes Scott of MIT did not know the existence of repulsive gravitation. Since Morrison passed away in 2005, nobody in MIT understands general relativity.
2) Accepting unbounded solutions does not help because the gravitational radiation requires the solution is bounded.
3) They forget to prove a bounded dynamic solution exists.
4) Einstein had mistaken because he had proposed inadequately that the photons consist of only electromagnetic energy. Thus, the repulsive gravitation is not discovered until 1997 [62].
5) Experiments show that a charged capacitor lifter would hover above earth on a certain height [35].
6) In current theory, there is no force outside a capacitor since the electromagnetic force is absent form the outside.
7) Liu used a roll-up capacitor to show that the weight reduction of a capacitor is not directional. However, earlier physicists incorrectly believed such weight reduction is directional [5, 35].
8) The experiment based on the torsion balance scale provides a clear evidence for the repulsive gravitation [63].
9) Witten has attended the Economic Department and the Applied Mathematics Department and the Physics Department of Princeton University. However, he did not have any formal training in pure mathematics. Perhaps, this deficiency may explain his inadequacy in mathematics at the undergraduate level as the Wheeler School [48].
10) There is a disagreement between Yau and Einstein, who found that there is no wave solution for his equation [2].

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