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On the Nobel Prize in Physics, Controversies and Influences

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Abstract - The Nobel Prizes were established by Alfred Bernhard Nobel for those who confer the "greatest benefit on mankind", and specifically in physics, chemistry, peace, physiology or medicine, and literature. In 1968 the Nobel Memorial Prize in Economic Sciences was established. However, the proceedings, nominations, awards, and exclusions have generated criticism and controversy. The controversies and influences related to the Nobel Physics Prize are discussed. The 1993 Nobel Prize in Physics was awarded to Hulse and Taylor, but the related theory was still incorrect as Gullstrand conjectured. The fact that Christodoulou received honors for related errors testified, "Unthinking respect for authority is the greatest enemy of truth" as Einstein asserted. The strategy based on the recognition time lag failed because of mathematical and logical errors. These errors were also the obstacles for later crucial progress. Also, it may be necessary to do follow up work after the awards years later since an awarded work may still be inadequately understood. Thus, it is suggested: 1) To implement the demands of Nobel's will, the Nobel Committee should rectify their past errors in sciences. 2) To timely update the status of achievements of awarded Nobel Prizes in Physics, Chemistry, and Physiology or Medicine. 3) To strengthen the implementation of Nobel's will, a Nobel Prize for Mathematics should be established.

Keywords : controversies; nobel prize; errors; influences, suggestions.

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ON THE NOBEL PRIZE IN PHYSICS, CONTROVERSIESAND INFLUENCES

Strictly as per the compliance and regulations of :

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Abstract - The Nobel Prizes were established by Alfred Bernhard Nobel for those who confer the "greatest benefit on mankind", and specifically in physics, chemistry, peace, physiology or medicine, and literature. In 1968 the Nobel Memorial Prize in Economic Sciences was established. However, the proceedings, nominations, awards, and exclusions have generated criticism and controversy. The controversies and influences related to the Nobel Physics Prize are discussed. The 1993 Nobel Prize in Physics was awarded to Hulse and Taylor, but the related theory was still incorrect as Gullstrand conjectured. The fact that Christodoulou received honors for related errors testified, "Unthinking respect for authority is the greatest enemy of truth" as Einstein asserted. The strategy based on the recognition time lag failed because of mathematical and logical errors. These errors were also the obstacles for later crucial progress. Also, it may be necessary to do follow up work after the awards years later since an awarded work may still be inadequately understood. Thus, it is suggested: 1) To implement the demands of Nobel's will, the Nobel Committee should rectify their past errors in sciences. 2) To timely update the status of achievements of awarded Nobel Prizes in Physics, Chemistry, and Physiology or Medicine. 3) To strengthen the implementation of Nobel's will, a Nobel Prize for Mathematics should be established.

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"The whole of my remaining realizable estate shall be dealt with in the following way: the capital, invested in safe securities by my executors, shall constitute a fund, the interest on which shall be annually distributed in the form of prizes to those who, during the preceding year, shall have conferred the greatest benefit on mankind."
-- from the will of Alfred Bernhard Nobel, 1833-1895.

I. The Nobel Prizes [1)]

The Nobel Prizes were established in 1895 by the Swedish chemist Alfred Bernhard Nobel, the inventor of dynamite. They were first awarded in 1901 for achievements in Physics, Chemistry, Physiology or Medicine, Literature, and Peace. An associated prize, the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, was instituted by Sveriges Riksbank in 1968 and first awarded in 1969. Although this is not technically a Nobel Prize, its winners are announced with the Nobel Prize recipients, and it is presented at the Nobel Prize Award Ceremony.[1)] However, there is no additional prize for achievements in Mathematics.

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Each Nobel Prize recipient (laureate) is presented with a gold medal, a diploma, and a varying sum of money. The amount of money awarded each year is dependent upon the annual income of the Nobel Foundation; in 2009, the amount was 10 million SEK (c. US$1.4 million) per prize. If a prize is awarded jointly to two or more laureates, the money is split among them.

The prizes are awarded by different associations. The Royal Swedish Academy of Sciences awards the Nobel Prize in Physics, the Nobel Prize in Chemistry, and the Nobel Memorial Prize in Economic Sciences; the Nobel Assembly at Karolinska Institutet awards the Nobel Prize in Physiology or Medicine; and the Swedish Academy grants the Nobel Prize in Literature. However, the Nobel Peace Prize is awarded by the Norwegian Nobel Committee.

In this paper, basic facts on the Nobel Prize before 1993 are based on Wikipedia. They are essentially in sections 1-3 as part of the background information. Starting from Section 4, the errors of the 1993 Nobel committee for physics and the influences are discussed in detail because they are also crucial obstacles to later progress. Then, suggestions for remedy are made in the conclusion section. Also, some crucial errors are presented and rectified in the Appendix A. Moreover, for convenient references, the controversies before 1993 are listed to in Appendix B.

a) The Nobel Foundation [1)]

Alfred Nobel was born on 21 October 1833 in Stockholm, Sweden, into a family of engineers. He was a chemist, engineer, inventor, and manufacturer. Nobel amassed a fortune during his lifetime, most of it from his 355 inventions, of which dynamite is the most famous. To the surprise of many, Nobel requested in his last will that his fortune be used to create a series of prizes for those who confer the "greatest benefit on mankind" in physics, chemistry, peace, physiology or medicine, and literature. Nobel bequeathed 94% of his total assets, 31 million SEK (c. US$186 million in 2008), to establish the five Nobel Prizes. Because of the level of skepticism surrounding the will, it was not until 26 April 1897 that it was approved by the Storting in Norway. The executors of his will formed the Nobel Foundation to take care of Nobel's fortune and organize the prizes.

In 1900, the Nobel Foundation's newly created statutes were promulgated by King Oscar II. In 1905, the

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Union between Sweden and Norway was dissolved, which meant the responsibility for awarding Nobel Prizes was split between the two countries. Norway's Nobel Committee became responsible for awarding the Nobel Peace Prize and Sweden responsible for the other prizes. The Nobel Foundation is exempt from all taxes in Sweden (since 1946) and from investment taxes in the United States (since 1953). Since the 1980s, the Foundation's investments have become more profitable and as of 2007, the assets controlled by the Nobel Foundation amounted to 3.628 billion Swedish *kronor* (c. US$560 million). Another important task of the Nobel Foundation is to market the Nobel Prize internationally and to oversee informal administration related to the prizes; but is not involved in the process of selecting the Nobel laureates.

According to the statutes, the Foundation should consist of a board of five Swedish or Norwegian citizens, with its seat in Stockholm. The Chairman of the Board should be appointed by the King in Council, with the other four members appointed by the trustees of the prize-awarding institutions. An Executive Director is chosen from among the board members, a Deputy Director is appointed by the King in Council, and two deputies appointed by the trustees. However, since 1995 all the members of the board have been chosen by the trustees, and the Executive Director and the Deputy Director appointed by the board itself. As well as the board, the Nobel Foundation is made up of the prize-awarding institutions, (the Royal Swedish Academy of Sciences, the Nobel Assembly, the Swedish Academy, and the Norwegian Nobel Committee), the trustees of these institutions, and auditors.

b) The Prize in Economic Sciences [1)]

Sveriges Riksbank celebrated its 300th anniversary in 1968 by donating large sum of money to the Nobel Foundation. The following year, the Nobel Memorial Prize in Economic Sciences was awarded for the first time. The Royal Swedish Academy of Sciences became responsible for selecting laureates. Although not technically a Nobel Prize, it is identified with the award; its winners are announced with the Nobel Prize recipients, and the Prize in Economic Sciences is presented at the Nobel Prize Award Ceremony. The Board of the Nobel Foundation decided that after this addition, it would allow no further new prizes.

II. The Award Process [1)]

The award process is similar for each Nobel Prize, the main difference being the choice of individuals responsible for the nominations for a particular prize.

a) The Nominations

First, nomination forms are sent out by the Nobel Committee to about 3000 individuals, usually in September the year before the prize is awarded. These individuals are often professors working in the same area as the prize they provide nominations for. For the Peace Prize, inquiries are sent to governments, members of international courts, professors and rectors, former Peace Prize laureates and current or former members of the Norwegian Nobel Committee. The deadline for the return of the nomination forms is 31 January of the year the prize is to be awarded. The Nobel Committee looks at the forms and selects preliminary candidates. The Nobel Committee may also add additional names and often about 300 potential laureates are nominated. The names of the nominees are not publicly announced, and neither are they told that they have been considered for the prize. All nomination records for a prize are sealed for 50 years from the awarding of that prize.

b) The Selections

The Nobel Committee then consults experts in the relevant fields about the list of preliminary candidates. Using advice from the experts the Nobel Committee then writes a report, which along with the list is signed and then submitted to the prize awarding institutions. The prize-awarding institutions meet to consider the lists and vote on who will become the next laureate or laureates in each field. This is done through a majority vote and their decision is final and not subject to appeal. The names of the laureates are announced immediately after the vote. A maximum of three laureates and two different works may be selected per award. Except for the Peace Prize, which can be awarded to institutions, the awards can only be given to individuals.

c) Posthumous Nominations

While posthumous nominations are not permitted, individuals who died in the months between their nomination and the decision of the prize committee were originally eligible to receive the prize. This occurred twice: the 1931 Literature Prize awarded to Erik Axel Karlfeldt, and the 1961 Peace Prize awarded to UN Secretary General Dag Hammarskjöld. Since 1974 laureates must be alive at the time of the October announcement. There has been one laureate, William Vickrey, who died after the prize was announced but before it could be presented.

d) The Recognition Time Lag

Nobel's will provides for prizes to be awarded in recognition of discoveries made "during the preceding year" and during the early years of the awards the discoveries recognized were often recent. However, some awards were made for discoveries that were later discredited. Taking the discrediting of a recognized discovery as an embarrassment, the awards committees began to recognize scientific discoveries that had withstood the test of time. Since the first years the discrepancy between award and initial discovery has occurred more often. According to Ralf Peterson, former chairman of the Nobel Prize Committee for Physiology or Medicine, "the criterion 'the previous year' is interpreted by the Nobel Assembly as the year when the full impact of the discovery has become evident."

The interval between the accomplishment of the achievement being recognized and the awarding of the Nobel Prize varies from discipline to discipline. Awards in the scientific disciplines of physics, chemistry, and medicine require that the significance of the achievement being recognized is "tested by time." In practice, this means that the lag between the discovery and the award is typically 20 or more years. For example, Subrahmanyan Chandrasekhar shared the 1983 Nobel Prize in Physics for his work on stellar structure and evolution from the 1930s. Not all scientists live long enough for their work to be recognized. Some important scientific discoveries can never be considered for a Prize if the discoverers have died by the time the impact of their work is realized.

However, this recognition time lag did not completely protect the Nobel Committee from making errors in sciences [1-6] since the implicit assumption of no mathematical or logical errors could be invalid. For instance, Enrico Fermi received the Nobel Prize in Physics in 1938. That Fermi's interpretation was incorrect was discovered shortly after he had received his prize. The 1993 Nobel Physics Prize awarded jointly to Russell A. Hulse and Joseph H. Taylor, Jr for the discovery of a new type of pulsar. Based on an invalid linearization of more than 90 years old [1], due to the practice of biased authority worship, it was claimed that Einstein's theory has passed the tests with flying colours [2]. However, it was proven in 1995 that, just as Gullstrand suspected [3], the Einstein equation actually cannot have a bounded dynamic solution for a two-body problem or a gravitational wave solution [4-6]. Moreover，it has been found recently that these errors can actually be illustrated with mathematics at the undergraduate level [7-9]. Thus, such errors are no longer in doubt although some [10-13] have incorrectly claimed otherwise.

e) The Nobel lectures

According to the statutes of the Nobel Foundation, each laureate is required to hold a public lecture on a subject related to the topic for which they will be awarded the Nobel Prize. The lectures normally occur during Nobel Week, before the award ceremony. This is not mandatory – the laureate is only obliged to hold the lecture within six months of receiving the prize. Laureates have held their lectures even later, as for example Theodore Roosevelt, who won the Peace Prize in 1906 and held the lecture in 1910 after finishing his presidency. The lectures are organized by the same association who selected the laureates. Merits of the Nobel lectures are that frontier thoughts and sometimes also the popular errors of time being would be shown in such speeches. For instance, in 1999 G. t'Hooft [14] showed that special relativity as well as Newtonian theory are inadequately understood [15] because of the unconditional $E = mc^2$.

III. Controversies and Criticisms [1)]

Since the first Nobel Prize was awarded in 1901, the proceedings, nominations, awards, and exclusions have generated criticism and controversy. The Prizes in Literature and Peace have tended to generate the most criticism, while the other Prizes have generally received less. Given the strict rules, controversies are inevitable.

The strict rule against a prize being awarded to more than three people at once is also a cause for controversy. When a prize is awarded to recognize an achievement by a team of more than three collaborators one or more will miss out. For example, in 2002, the Prize was awarded to Koichi Tanaka and John Fenn for the development of mass spectrometry in protein chemistry, an award that failed to recognize the achievements of Franz Hillenkamp and Michael Karas of the *Institute for Physical and Theoretical Chemistry* at the University of Frankfurt. Similarly, the prohibition of posthumous awards fails to recognize achievements by an individual or collaborator who dies before the prize is awarded. Rosalind Franklin, who was a key contributor in the discovery of the structure of DNA in 1953, died of ovarian cancer in 1958, four years before the achievement was recognized by awarding Francis Crick, James D. Watson, and Maurice Wilkins the Prize for Medicine or Physiology in 1962.

Rarely, the prize committees have missed entire previous bodies of work and assigned discovery credit to relative late-comers. An example is the 2000 prize in chemistry for "The discovery and development of conductive polymers." Prof. Dr. György Inzelt at Eötvös Loránd University says that, while they certainly deserve credit for publicizing and popularizing the field, conductive polymers were "produced, studied and even applied" before the laureates' work.

a) Emphasis on Discoveries over Inventions and Theories [1)]

Alfred Nobel left his fortune to finance annual prizes to be awarded "to those who, during the preceding year, shall have conferred the greatest benefit on mankind." He stated that the Nobel Prizes in Physics should be given "to the person who shall have made the most important 'discovery' or 'invention' within the field of physics." Nobel did not emphasize discoveries, but they have historically been held in higher respect by the Nobel Prize committee than inventions: 77% of Nobel Prizes in Physics have been given to discoveries, compared with only 23% to inventions. Christoph Bartneck and Matthias Rauterberg, in papers published in Nature and Technoetic Arts, have argued this emphasis on discoveries has moved the Nobel Prize away from its original intention of rewarding the greatest contribution to society.

An example where discovery has been preferred over theory would be Albert Einstein's Nobel Prize. In 1921 Einstein was awarded the Nobel Prize in Physics, but not for his Special Theory of Relativity which he had postulated 16 years earlier. His award was given "for his services to Theoretical Physics, and especially for his discovery of the law of the photoelectric effect." The Theory of Relativity has never been recognized with a Nobel Prize. Historian Robert Friedman proposes that this may be due to the Nobel Committee's discrimination against theoretical science.

However, the above case is actually in favor of the Nobel Committee. There still are problems in the theory of relativity. The formula $E = mc^2$ is proven to be only conditionally valid [15-18]. Recently, it is found that Einstein's theory of measurement was actually justified with invalid applications of special relativity and his covariance principle is proven to be incorrect [19-21]. Moreover, Einstein's theory of measurement actually leads to disagreement with experiments on the bending of light [19, 22, 23]. Thus, this theory of more than 100 years old still requires rectifications.

b) Controversies and Errors in Physics [1)]

There are controversies on Nobel Prizes for physics since 1909 (Wikipedia). [2)] The controversies before 1993 are simply listed in Appendix B because they do not seem to have serious consequences to subsequent developments of physics. However, the nature of controversies since 1993 would need serious deliberation.

The 1993 Nobel Physics Prize was awarded jointly to Russell A. Hulse and Joseph H. Taylor, Jr, for the discovery of a new type of pulsar. However, based on invalid mathematics with a history of more than 80 years old [1, 4], it was incorrectly claimed that *Einstein's theory has passed the tests with flying colours* [2] (see also Appendix A). There was considerable controversy when the 2008 Nobel Physics Prize was given for the discovery of the CKM matrix, a genuine Nobel quality achievement [24]. Why then was there a controversy? Note that "CKM" is an abbreviation for Cabibbo, Kobayashi, and Maskawa; whereas only Kobayashi and Maskawa were awarded the Prize. But the essential idea was due to Cabibbo in the 1950s, and all Kobayashi and Maskawa did was to expand on his idea in the 1970s. Kobayashi and Maskawa would have done nothing without Cabibbo's absolutely essential first step.

IV. Some Problems Related to Controversies and Errors in Physics [1)]

In the will of Alfred Bernhard Nobel, he explicitly stated, "The whole of my remaining realizable estate shall be dealt with in the following way: the capital, invested in safe securities by my executors, shall constitute a fund, the interest on which shall be annually distributed in the form of prizes to those who, during the preceding year, shall have conferred the greatest benefit on mankind." and "It is my express wish that in awarding the prizes no consideration whatever shall be given to the nationality of the candidates, but that the most worthy shall receive the prize, whether he be a Scandinavian or not." Therefore, controversies on who should get the prize cast some doubt whether the will of Nobel is well executed. However, nothing human can always be perfect, and exclusions are often not rectifiable.

Nevertheless, errors in physics are definitely against the spirit of the Prize in Physics and Nobel's wish of conferring the greatest benefit on mankind. Therefore, it is the duty of the will executioners to correct such errors, whose damages are rectifiable. In other words, the Nobel Committee has the duty to rectify the errors that they have spread. It has been known that there are at least two cases that such errors have occurred. They are:

1) Enrico Fermi received the Nobel Prize in Physics in 1938 in part for "his demonstrations of the existence of new radioactive elements produced by neutron irradiation". That Fermi's interpretation was incorrect was discovered shortly after he had received his prize. [1)] However, his mistake is subsequently well known and the contributions of Fermi indeed deserve a Nobel Prize. Thus, for this case, no subsequent actions are needed.
2) Hulse and Taylor received the Nobel Prize in Physics in 1993. While their experimental work may deserve a Nobel Prize, the related theoretical interpretations are incorrect in both physics and mathematics. In fact, the Einstein equation has been proven invalid for the dynamic case since it does not have a dynamic solution or a wave solution, and that the Hulse & Taylor experiments actually support a modified Einstein equation. This was recognized by Nobel Laureate Chandrasekha and Lo [4, 5] in 1995. Thus, it is obvious that the 1993 press release of the Nobel Committee in Physics would have created significant damage to the theoretical developments in physics. 't Hooft, a Nobel Laureate, did attempt to challenge such a conclusion with his "wave" solution [23]. However, it turns out that this only exposes his shortcoming in physics at the undergraduate level [25, 26] (see also next Section).

V. The Nobel Prize Committee for Physics, Influences and Mathematics

Obviously, the establishment of prizes for sciences is to encourage research and thus help its progress. However, misjudged prizes can happen and create very bad influences. In particular, a well-established prize such as the Nobel Prize, if inappropriately awarded, can do lots of damage because its reputation could create wrong messages to sciences. Thus, to implement the will of Nobel to encourage conferring the greatest benefit on mankind, not only selections of the Nobel Prize recipients must be carefully chosen, but also the significance of such an awarded prize should also be updated because understanding at the time of the award may not be entirely appropriate for progress.

Some regarded my criticisms on the news release of the 1993 Nobel Committee for Physics as an attack to the Nobel Committee. However, if one knows the history of the Committee and understand the mathematics, one will see this as completely nonsense. In fact, I am defending Einstein's equivalence principle as well as the honor of A. Gullstrand, the chairman of the Nobel Committee for Physics (1922-1929), who raised the question that the Einstein equation may not have a valid solution for the perihelion of Mercury. To cover up their ignorance in sciences, some theorists even accused that Gullstrand has abused his power and that the Nobel Committee has Swedish bias.

In my opinion, Gullstrand must be pretty good in mathematics because he challenged not only Einstein but also D. Hilbert, a famous mathematician, who approved Einstein's calculation [27]. Apparently Hilbert was unaware of the need of a bounded dynamic solution for the perturbation approach used. Being an excellent mathematician, Hilbert naturally did not participate in the subsequent efforts for the defense of Einstein's claim. Nevertheless, due to confusing mathematics and physics, many failed to see this. [3)] In fact, due to errors in undergraduate mathematics [28], Christodoulou & Klainerman [11] claimed with a book that they have constructed dynamic solutions. Although their efforts are proven futile [4, 5], progress in physics did suffer not only from their errors, but also wasting the resource. Fortunately such a struggle comes to an end when their errors can be illustrated with mathematics at the undergraduate level [6-9]. Moreover, only after the non-existence of a dynamic solution for the Einstein equation was recognized, Einstein's conjecture of the unification between electromagnetism and gravitation is proven correct [1, 4-9, 15].

Nevertheless, errors of the Nobel Committee for Physics [2] that rejected Einstein's equivalence principle and correct mathematics, misled to false confidence on errors. Hence, the mistakes of the 1993 Nobel Committee probably have led to a number of awards and honors for the errors of D. Christodoulou (Wikipedia) as follows:

MacArthur Fellows Award (1993);

Bôcher Memorial Prize (1999);

Member of American Academy of Arts and Sciences (2001);

Tomalla Foundation Prize (2008);

Shaw Prize (2011);

Member of U.S. National Academy of Sciences (2012).

Note that there are many explicit examples that show the claims of Christodoulou are incorrect [7-9].[4)] However, due to the practice of biased authority worship, many theorists just ignored them. Physically, a bounded dynamic solution should exist, but Einstein's field equation just does not have such a solution (see also Appendix A).

It seems Christodoulou could have had a Nobel Prize if there were such a prize in mathematics. However, this could also have attracted the attention of many mathematicians. Thus, the errors of Christodoulou [11] would be exposed clearly much earlier. Note that their book [11] has been criticized by mathematician Volker Perlick [28, 29] as "incomprehensible". Moreover, S. T. Yau has politely lost his earlier interests on their claims [11]. The awards and honors to Christodoulou clearly manifested an unpleasant fact that most of the physicists do not understand pure mathematics adequately and many applied mathematicians do not understand physics.

Thus, subsequent theorists failed to see [15] that the implicit assumption of unique coupling sign of space-time singularity theorems is invalid in physics, that $E = mc^2$ is only conditionally valid, that the increase of energy need not necessarily lead to a stronger attractive gravity, that the mass-charge interaction shows the conjecture of Einstein's unification is correct, and that the photons must include gravitational energy [30].

In general relativity, Einstein's principle of covariance and theory of measurement has been found to be invalid through explicit examples [31, 32]. However, the misunderstanding on the notion of gauge invariance [33] persistently claimed by C. N. Yang [34, 35], etc. was probably responsible for prolonging the incorrect acceptance of Einstein's covariance principle and thus a timely recognition of the work of Zhou Pei-Yuan [36]. Moreover, the lack of explicit examples from Einstein to illustrate his equivalence principle makes it possible to have popular misinterpretations [37]. In fact, it affects almost all areas in physics.

Moreover, many failed to see that Einstein's theory of measurement is invalid as pointed out by Whitehead [38] before it was discovered the justifications of Einstein's theory of measurement were based on invalid applications of special relativity [31]. Together with the failure in recognizing that the singularity theorems of Penrose and Hawking [12] are irrelevant to physics, many physicists illogically interpreted the redshifts of Hubble as due to Doppler effects [39]. The fact that Hubble himself objected to such an interpretation is simply ignored [40]. Apparently, the errors of the 1993 Nobel Committee for Physics strengthened the dubious confidence of cosmologists. Then in 2006, the Shaw Prize prematurely awarded Saul Perlmutter, Brian P. Schmidt, and Adam G. Riess for the 1998 claim of the accelerating expansion of the Universe through observations of redshifts of distant supernovae, [5)] while whether the universe is expanding is still questionable. Subsequently, in 2011 these gentlemen were also awarded with a Nobel Prize for the same work since the award of a Shaw Prize was not strongly objected.

Thus, errors in a news release of a Nobel Prize Committee can also have far reaching negative consequences in the development of physics.[6)] Such damages have had a long life because of the practice of biased "authority worship".[7)]

Now general relativity is clearly an incomplete theory that remains to be explored. In terms of physics, a basic problem is that just as in Maxwell's classical electromagnetism [41], there is also no radiation reaction force in general relativity. Although an accelerated massive particle would create radiation [42], the metric elements in the geodesic equation are created by particles other than the test particle [43]. Another problem is that the exact field equation for the dynamic case is still not known. In short, these potentially great developments have been blocked because of the inadequacy of the theorists in mathematics and historical inadequacy in physics.

VI. Discussions and Suggestions

The opinions of the Nobel Committee are essentially only a mirror of the scientific intelligence of that time. A Nobel Prize awarded to an achievement can be only as good as the understanding of that time. Since a Nobel Prize carries a tremendous amount of prestige, it would be a good service to sciences if the Nobel Committee would also provide its status update. For instance, Einstein won a prize in 1921, in part, for proposing that the light is consisted of photons having only electromagnetic energy. While the existence of photons has been verified, they actually have non-electromagnetic energy [30, 44]. Then, gravity is clearly important for matter of microscopic scale.

Obviously, the lack of timely updates and necessary rectifications of mistakes would hinder the normal progress of sciences [45]. For instance, the failure of recognizing the non-existence of dynamic solutions for the Einstein equation would lead to the failure to see that there are necessary different coupling signs [4]. This in turn failed to see that the famous formula $E = mc^2$ is only conditionally valid [16-18]. Consequently, the fact that the electromagnetic energy is not equivalent to mass is ignored and the inadequacy of Einstein's assumption on the photons was not recognized [30, 41]. These are the main reasons that necessary unification of gravitation and electromagnetism as a consequence of general relativity were not recognized until 2006 [46] although the crucial Reissner-Nordstrom metric for such a conclusion was derived in 1916, the same year of Einstein's paper on general relativity. Now, it is clear that the 1993 press release of the Nobel Committee has led to significant damage to the development of general relativity.

Fortunately, Eric J. Weinberg, editor of the Physical Review D, demands a verification of the conditional validity of $E = mc^2$ beyond electromagnetism [19]. [7)] This leads to the discovery of the mass-charge static repulsive force and its experimental verifications [19, 46, 47]. Since the mass-charge static repulsive force has been verified, the photons have non-electromagnetic energy follows. The discovery of this fifth force would explain the NASA Pioneer Anomaly, [8)] which no existing theories can explain [48, 49].[9)] Recently, experiments on weighing heated up metals have shown [50] that their weights reduce, and thus Einstein's prediction [51] based on $E = mc^2$ has been proven wrong.

The discovery that $E = mc^2$ being conditionally valid has led to the need of re-examining two concepts namely:

1. Gravity would always be attractive since masses attract each other. Such a belief is the foundation of the theories of black holes [52].
2. All the coupling constants have the same sign, which is the crucial physical assumption for the spacetime singularity theorems [5, 12].

However, the Hulse-Taylor experiments necessitate that there are different coupling signs for the massive energy-stress tensor and the gravitational energy-stress tensor [4, 5]. Thus, the theoretical existence of black holes cannot be guaranteed, and the spacetime singularity theorems are irrelevant to physics.

Note that the failure of recognizing the non-existence of a dynamic solution has its origin in false mathematics that was prevailed in the time of Einstein. Such problems could have been solved clearly if competent mathematicians such as D. Hilbert were involved. However, such mathematicians were not involved, in part, because the Nobel Prize Committee has no prize for mathematics. Later, main errors were created at Princeton University [10)] with the leadership of Wheeler, very competent in academic politics, and thus valid criticisms were just ignored.

Thus, due to inadequacy in pure mathematics, theorists do not see that linearization of the Einstein equation is not always valid [1, 4]. The ambiguity of coordinates helps maintaining such a failure [19]. The misinterpretation of Einstein's equivalence principle started by Pauli [53] is also due to inadequacy in pure mathematics [23]. This problem was not solved because Einstein's covariance principle is actually invalid. Moreover, with invalid applications of special relativity as the justifications [18], Einstein invalidly adapted a mathematical notion of distance in a Riemannian geometry to the physical space. Then, he had to create his invalid covariance principle as remedy [43, 54].

Clearly, many problems in general relativity have their origin partially from failure in mathematics. The Nobel Committee failed to recognize these because the committee failed to consult scientists, who are very good in mathematics. A well-known exception is Gullstrand [3] being a member of the committee in 1921. Moreover, as Einstein said, theories can be supported but cannot be proven with experiments.

The lack of competent mathematicians to help the Nobel Committee could be traced to that there is no Nobel Prize for mathematics. To remedy such a situation thereafter, the Nobel foundation should consider starting a Nobel Prize in mathematics. Although the will of Nobel did not explicitly include a prize for Mathematics, this is consistent with his desire of conferring "the greatest benefit on mankind". In his time, it was not clear how crucial pure mathematics is to sciences. Now, sciences have developed to such a stage that frontier scientists no longer can leave all the crucial mathematics to others. A Nobel Prize in Mathematics seems to be urgently needed [55] to fulfill the will of Nobel better since experimental data can be misinterpreted and the strategy of time lag recognition can fail.

In short, to deal with the above problems, the suggestions are the following:

A. To implement the demands of Nobel's will, the Nobel Committee should rectify their past errors in sciences. Such errors could be crucial obstacles to necessary progress as shown in the case of 1993 Nobel Prize for Physics.

B. To timely update the status of achievements of awarded Nobel Prizes in Physics, Chemistry, and Physiology or Medicine when clarifications are necessary. This would further enhance the service to the will of Nobel.

C. To strengthen the implementation of Nobel's will, a Nobel Prize for Mathematics should be established.

In conclusion, nothing can damage sciences more than biased authority worship and mathematics is an important tool. Moreover, it is over due for the Nobel Committee to remedy the errors advocated in their 1993 news release.

Princeton University, though a major source of errors [11-13], should actively rectify these errors and once again participate in the leadership for new developments in fundamental physics. Also, many problems are due to authors who did not read Einstein's original papers, but relying on second hand misinterpretations [12, 13]. Thus, *a textbook for general relativity with proper reference to Einstein and rectification of his errors, is urgently needed.* Also, the string theory, if correct, must be able to include the experimentally verified charge-mass interaction, discovered from general relativity [10, 50]. It is hoped this paper would also help theorists to look at unsolved problems squarely.[8)]

VII. Acknowledgment

This article is dedicated to Alfred Bernhard Nobel, whose will and fortune created the Nobel Foundation that makes the Nobel Prizes possible. Special thanks are to S. Holcombe for editing the English.

Appendix A : Dynamic Solution, the Maxwell-Newton Approximation, and the Equivalence Principle

A problem in general relativity [4] is that, for a dynamic case, there is no bounded solution,

$$\text{Constant} > | g_{ab} (x, y, z, t), \qquad \text{(A1)}$$

for the Einstein equation, where g_{ab} is the space-time metric [43]. In fact, eq. (A1) is also a necessary implicit assumption in calculating Einstein's radiation formula [56] and the light bending. However, although such a requirement can be satisfied for the static case, it fails for a dynamic case [4].

Gullstrand [3] challenged Einstein and also Hilbert who approved Einstein's calculations [27]. Apparently Hilbert was unaware of the need of a bounded dynamic solution for the perturbation approach to this issue. However, Hilbert, being an excellent mathematician, did not participate in the subsequent defense of Einstein's claim. Nevertheless, many failed to see this, and tried very hard to prove otherwise. Their efforts have been proven as futile [4, 8].

The failure of producing a dynamic solution would cast a strong doubt to the validity of the linearized equation that produces many effects including the gravitational waves. In fact, for the case that the source is an electromagnetic plane wave, the linearized equation actually does not have a bounded solution.

Nevertheless, there must be a way to justify the linearized equation with massive sources, independently. Such an investigation has led additionally to a modified Einstein equation that would have dynamic solutions. To this end, Einstein's equivalence principle [57] is needed, and thus this principle, though rejected by the 1993 Nobel Prize Committee for Physics implicitly [2], is crucial in general relativity.

A1. Gravitational Waves and the Einstein Equation of 1915

Relativity requires the existence of gravitational waves because physical influence must be propagated with a finite speed [58]. To this end, let us consider the

Einstein equation of 1915 [43]. Einstein believed that his equation satisfied this requirement since its linearized "approximation" gives a wave solution.

The linearized equation with massive sources [43] is the Maxwell-Newton Approximation [4],

$$\frac{1}{2}\partial_c\partial^c\bar{\gamma}_{ab} = -\kappa T(m)_{ab}\,, \qquad (A2)$$

where $\bar{\gamma}_{ab} = \gamma_{ab} - (1/2)\eta_{ab}$, $\gamma_{ab} = g_{ab} - \eta_{ab}$, $\gamma = \eta^{cd}\gamma_{cd}$, and η_{ab} is the flat metric. Eq. (A2) has a mathematical structure similar to that of Maxwell's equations. A solution of eq. (A2) is

$$\bar{\gamma}_{ab}(x_i,t) = -\frac{\kappa}{2\pi}\int\frac{1}{R}T_{ab}\,[y^i,(t-R)]\,d^3y, \quad \text{where}$$

$$R^2 = \sum_{i=1}^{3}\left(x^i - y^i\right)^2 \qquad (A3)$$

note that the Schwarzschild solution, after a gauge transformation, can also be approximated by (A3). Solution (A3) would represent a wave if T_{ab} has a dynamical dependency on time t' (= t – R). Thus, the theoretical existence of gravitational waves seems to be assured as a certainty as believed [53, 56, 59].

However, for non-linear equations, the physical second order terms can be crucial for the mathematical existence of bounded solutions. For Einstein equation (1), the Cauchy initial condition is restricted by four constraints since there is no second order time derivatives in G_{at} (a = x, y, z, t) [56]. This suggests that Einstein equation (1) and eq. (A1) may not be compatible for a dynamic problem. Einstein discovered that his equation does not admit a propagating wave solution [60, 61]. Recently, it has been shown that the linearization procedure is not generally valid in mathematics [4]. Thus, it is necessary to justify wave solution (A3) independently.

A2. The Weak Gravity of Massive Matter and Einstein Equation of the 1995 Update

For a massive source, the linear equation (A2), as a first order approximation, is supported by experiments [43]. However, for the dynamic case, the Einstein equation is clearly invalid.

It will be shown that eq. (A2) can be derived from Einstein's equivalence principle. Based on this principle, the equation of motion for a neutral particle is the geodesic equation. In comparison with Newton's second law, one obtains that the Newtonian potential of gravity is approximately $c^2g_{tt}/2$. Then, in accord with the Poisson equation and special relativity, the most general equation for the first order approximation of g_{ab} is,

$$\frac{1}{2}\partial_c\partial^c\gamma_{ab} = -\frac{\kappa}{2}\,[\alpha T(m)_{ab} + \beta\,\hat{T}(m)\eta_{ab}], \qquad (A4a)$$

where

$$\hat{T}(m) = \eta^{cd}T(m)_{cd}\,,\ \kappa = 8\pi Kc^{-2}\,,\ \text{and}\ \ \alpha+\beta = 1, \qquad (A4b)$$

where α and β are constants since Newton's theory is not gauge invariant.

Then, according to Riemannian geometry [56], the exact equation would be

$$R_{ab} + X^{(2)}{}_{ab} = -\frac{\kappa}{2}[\alpha T(m)_{ab} + \beta\,T(m)g_{ab}], \quad \text{where}$$

$$T(m) = g^{cd}T(m)_{cd} \qquad (A5a)$$

and $X^{(2)}{}_{ab}$ is an unknown tensor of second order in K, if R_{ab} consists of no net sum of first order other than the term $(1/2)\,\partial_c\partial^c\gamma_{ab}$. This requires that the sum

$$-\frac{1}{2}\partial^c[\partial_b\gamma_{ac} + \partial_a\gamma_{bc}] + \frac{1}{2}\partial_a\partial_b\gamma\,, \qquad (A5b)$$

must be of second order. To this end, let us consider eq. (A4a), and obtain

$$\frac{1}{2}\partial_c\partial^c(\partial^a\gamma_{ab}) = -\frac{\kappa}{2}[\alpha\partial^aT(m)_{ab} + \beta\partial_b\hat{T}(m)]. \quad (A6a)$$

from $\nabla^cT(m)_{cb} = 0$, it is clear that K $\partial^cT(m)_{cb}$ is of second order but $K\partial_b\hat{T}(m)$ is not. However, one may obtain a second order term by a suitable linear combination of $\nabla^c\gamma_{cb}$ and $\partial_b\gamma$. From (A6a), one has

$$\frac{1}{2}\partial_c\partial^c(\partial^a\gamma_{ab} + C\,\partial_b\gamma) = -\frac{\kappa}{2}[\alpha\partial^aT(m)_{ab} + (\beta + 4C\beta$$
$$+ C\alpha)\partial_b\hat{T}(m)]\,. \qquad (A6b)$$

Thus, the harmonic coordinates (i.e., $\partial^a\gamma_{ab} - \partial_b\gamma/2 \approx 0$), can lead to inconsistency. It follows eqs. (A5b) and (A6b) that, for the other terms to be of second order, one must have C = -1/2, α = 2, and β = -1. Hence, eq. (A4a) becomes,

$$\frac{1}{2}\partial_c\partial^c\gamma_{ab} = -\kappa[T(m)_{ab} - \frac{1}{2}\hat{T}(m)\,\eta_{ab}]\,. \qquad (A7)$$

which is equivalent to eq. (A2a), has been determined to be the field equation of massive matter. This derivation is independent of the exact form of equation (A5a). The implicit gauge condition is that the flat metric η_{ab} is the asymptotic limit. Eq. (A7) is compatible with the equivalence principle as demonstrated by Einstein in his calculation of the bending of light. Thus, the derivation is self-consistent.

Einstein obtained the same values for α and β by considering eq. (A5a) after assuming $X^{(2)}{}_{ab}$ = 0. His equation (A2) could also be "derived" from a more general linear equation, if one regards the gravitational

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field as a spin 2 field coupled to the energy-stress tensor [59], and the existence of bounded dynamic solutions be assumed.

An advantage of the approach of considering eq. (A4) and eq. (A5b) is that the over simplification $X^{(2)}_{ab} = 0$ is not needed. Then, it is possible to obtain from eq. (A5a) an equation different from eq. (A2),

$$G_{ab} \equiv R_{ab} - \frac{1}{2} g_{ab} R = - \kappa \, [T(m)_{ab} - Y^{(1)}_{ab}], \quad \text{(A8)}$$

where

$$-\kappa Y^{(1)}_{ab} = X^{(2)}_{ab} - \frac{1}{2} g_{ab} \{ X^{(2)}_{cd} \, g^{cd} \}.$$

The conservation law $\nabla^c T(m)_{cb} = 0$ and $\nabla^c G_{cb} \equiv 0$ implies also $\nabla^a Y^{(1)}_{ab} = 0$. If $Y^{(1)}_{ab}$ is identified as the gravitational energy tensor of $t(g)_{ab}$, Einstein equation of the 1995 update [4] is reaffirmed. Note, however, that in Einstein's initial consideration, $t(g)_{ab}$ is a pseudo-tensor. It has been shown that it must be a tensor [4].

A3. Einstein's Equivalence Principle and the Einstein-Minkowski Condition

Although most theorists agree with Einstein that his equivalence principle is the foundation of general relativity, there is no book or reference, other than Einstein's own work, that can state and explain his principle correctly. In particular, many often confused the principle with Einstein's 1911 invalid assumption of equivalence [62]. Another source of confusion is that many theorists have mistaken Pauli's invalid version [53] as Einstein's equivalence principle [63]. In this appendix, it would be appropriate to present first the misinterpretations and their errors.

A3.1 The Misinterpretations

Over the last decade, experiments [64] on the violations of Lorentz symmetry were conducted. In essence, the Lorentz symmetry says that the laws of physics are the same as required by special relativity for all (local) inertial observers moving through space, regardless of their velocity and orientation. Many regard a violation of the Lorentz symmetry also as a violation of general relativity. However, this notion actually comes from the misinterpretation of Einstein's equivalence principle by Misner, Thorne, & Wheeler [13] as follows:

"In any and every local Lorentz frame, anywhere and anytime in the universe, all the (non-gravitational) laws of physics must take on their familiar special-relativistic form. Equivalently, there is no way, by experiments confined to infinitesimally small regions of spacetime, to distinguish one local Lorentz frame in one region of spacetime frame from any other local Lorentz frame in the same or any other region."

They even claimed the above as Einstein's equivalence principle in its strongest form [13]. However, it actually is closer to Pauli's version [53], which Einstein regards is a misinterpretation [63], 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."

It has been shown [65] that: 1) the interpretation of Misner et al. also does not agree with Einstein's equivalence principle; 2) mathematical analysis shows that the interpretation of Misner et al. is not valid in physics; 3) based on general relativity, a violation of the Lorentz invariance is generally expected. In fact, special relativity is the only case that an infinistimal local Minkowski neighborhood always exists at any point. Apparently, they are probably unaware of that Einstein's equivalence principle is supported by experiments [19]. However, they should bear the responsibility of their misinformation on this principle by ignoring both crucial works of Einstein, i. e., references [43] and [54].

A3.2 Einstein's Equivalence Principle and its Misrepresentations

The misinterpretations manifest that many physicists have a tradition of inadequate background in pure mathematics. Moreover, in "Gravitation" [13], there is no reference to Einstein's equivalence principle (i. e. [43] and [54]). Instead, it misleadingly refers to Einstein's invalid 1911 assumption [62] and Pauli's invalid version [53].

Einstein's equivalence principle leads to the Einstein-Minkowski condition [43, 54], on which the time dilation and space contractions are based. On his equivalence principle, Einstein [43] wrote:

'Let now K be an inertial system. Masses which are sufficiently far from each other and from other bodies are then, with respect to K, free from acceleration. We shall also refer these masses to a system of co-ordinates K', uniformly accelerated with respect to K. Relatively to K' all the masses have equal and parallel accelerations; with respect to K' they behave just as if a gravitational field were present and K' were unaccelerated. Overlooking for the present the question as to the "cause" of such a gravitational field, which will occupy us latter, there is nothing to prevent our conceiving this gravitational field as real, that is, the conception that K' is "at rest" and a gravitational field is present we may consider as equivalent to the conception that only K is an"allowable" system of co-ordinates and no gravitational field is present. The assumption of the complete physical equivalence of the systems of coordinates, K and K', we call the "principle of equivalence;" this principle is evidently intimately connected with the law of the equality between the inert and the gravitational mass, and signifies an extension of the principle of relativity to coordinate systems which are non-uniform motion relatively to each other.'

Later, Einstein made clear that a gravitational field is generated from a space-time metric. What is new in Einstein's equivalence principle in 1916 is the claim of the Einstein-Minkowski condition as a consequence for gravity.

The Einstein-Minkowski condition has its foundation from mathematical theorems [66] as follows:

Theorem1. 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. After some algebra, a local Minkowski metric exists at any given point and along any time-like geodesic curve Γ.

However, these theorems imply only that the local metric is locally constant at a given point P. Thus, in general, gravity may not be transformed away in a small region by a coordinate transformation. In fact, Einstein [54; p.144] remarked with a counter example, "For it is clear that, e.g., the gravitational field generated by a material point in its environment certainly cannot be 'transformed away' by any choice of the system of coordinates…" Therefore, Einstein's claim of Pauli's version as being a misinterpretation [63] is well justified and correct.

Apparently, Pauli [53] and the Wheeler School [13] failed to understand the mathematics of the above theorems. Moreover, since a local Lorentz frame may have only one point with a local Minkowski metric, as Einstein pointed out [63], gravitation is not generally equivalent to acceleration. *Thus, one should not use his incorrect view earlier* [62].

Thorne [42] even criticized the distortion of Will [67] as if Einstein's equivalence principle as follows: "In deducing his principle of equivalence, Einstein ignored tidal gravitation forces; he pretended they do not exist. Einstein justified ignoring tidal forces by imagining that you (and your reference frame) are very small."

However, Einstein has already explained these problems in his letter of 12 July 1953 to Rehtz [63]. Moreover, Fock [68] tried to discredit Einstein by misidentification, but the Wheeler School [59] also followed such a claim.

Appendix B: The Controversies before 1993 (identified in Wikipedia) are Listed Below:

- Guglielmo Marconi received the 1909 Nobel Prize for his work on the radio, even though the US Patent Office awarded the patent to Nikola Tesla first, reversing its decision in Marconi's favour in 1904 and again in Tesla's favour in 1942. Thomas Edison and Tesla were mentioned as potential laureates in 1915, but it is believed that due to their animosity toward each other neither was ever given the award, despite their enormous scientific contributions.
- Chung-Yao Chao 赵忠尧 was the first person to capture positrons through electron-positron annihilation while a graduate student at Caltech in 1930, but did not realize what they were. Carl D. Anderson, who won the 1936 Nobel Physics Prize for his discovery of the positron, used the same radioactive source, Tl, as Chao. Late in his life, Anderson admitted that Chao had inspired his discovery: His research formed the foundation from which much of Anderson's work developed. Chao died in 1998, without the honor of sharing in a Nobel Prize acknowledgment.
- Enrico Fermi received the Nobel Prize in Physics in 1938 in part for "his demonstrations of the existence of new radioactive elements produced by neutron irradiation". That Fermi's interpretation was incorrect was discovered shortly after he had received his prize.
- Lise Meitner contributed directly to the discovery of nuclear fission in 1939 but received no Nobel recognition. In fact it was not Otto Hahn who first figured out fission but Meitner. Working with the then experimental data available, she managed, with Otto Robert Frisch's participation, to incorporate Bohr's liquid drop model (first suggested by George Gamow) into fission's theoretical foundation. She was known also to have predicted, from her research work on atomic theory and radioactivity, the possibility of chain reactions. In addition, in an earlier collaboration with Hahn, she had also independently discovered a new chemical element called (protactinium): Niels Bohr did in fact nominate both for the Nobel Prize in Physics for this work, besides his recommendation of the Nobel Prize in Chemistry for Hahn. The case served up an interesting and contrasting foil to that of Louis, 7th duc de Broglie's Nobel deliberations circa 1929: in particular, of the ways the Nobel Committee gave weight and judged between male and female contributors and their work. There was a third junior contributor Fritz Strassmann who was not considered for the Prize. In his defense, Hahn was under strong pressure from the Nazis to minimize Meitner's role since she was Jewish. But he maintained this position even after the war.
- Although the Brazilian physicist César Lattes was the main researcher and the first author of the historical *Nature* journal article describing the subatomic particle meson pi (pion), his lab boss, Cecil Powell, was awarded the Nobel Prize for

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Physics in 1950 for "his development of the photographic method of studying nuclear processes and his discoveries regarding mesons made with this method"; though it was actually Lattes himself who was solely responsible for the improvement on the nuclear emulsion used by Powell (by asking Kodak Co. to add more boron to it—and in 1947, he made with them his great experimental discovery). The reason for this apparent neglect is that the Nobel Committee policy until 1960 was to award the Nobel Prize to the research group head only. Lattes was also responsible for calculating the pion's mass and, with USA physicist Eugene Gardner, demonstrated the existence of this particle after atomic collisions in a synchrotron. Again, Gardner was denied a Nobel because he died soon thereafter, and posthumous nominations for the Nobel Prize are not permitted.

- The 1956 Prize was awarded to Bardeen, Shockley, and Brattain for the discovery of the transistor, because the Nobel committee did not recognize numerous preceding patent applications. As early as 1928, Julius Edgar Lilienfeld patented several modern transistor types. In 1934, Oskar Heil patented a field-effect transistor. It is unclear whether either had really built such devices, but they did cause later workers significant patent problems. Further, Herbert F. Mataré and Heinrich Walker, at Westinghouse Paris, applied for a patent in 1948 on an amplifier based on the minority carrier injection process. Mataré had first observed transconductance effects during the manufacture of germanium duodiodes for German radar equipment during World War 2.
- George Sudarshan and Robert Marshak were the first proponents of the successful V-A (vector minus axial vector, or left-handed) theory for weak interactions in 1957. Essentially, it is the same theory as that proposed by Richard Feynman and Murray Gell-Mann in their "mathematical physics" paper on the structure of the weak interaction. Actually, Gell-Mann had been let in on the former group's results before via open sharings that were intimated by Sudarshan himself to Gell-Mann earlier on, but no formal acknowledgment due the original theorists were found in Gell-Mann Feynman's subsequent joint paper, except for an informal allusion-the reason given out was that the originators' work was not published in a formal or 'reputable enough' science journal at the time-a reason also reminiscent of that found broached in the Rosalind Franklin-James D. Watson controversy case. Now it is popularly known in the west as the Feynman-Gell-Mann theory. The V-A theory for weak interactions was in effect a new Law of Nature discovered. It was conceived in the face of a string of apparently contradictory experimental results, including several of Chien-Shiung Wu's, though also helped along by a sprinkling of other evidences too, e.g. the muon (discovered in 1936, it had a colorful history itself – and would lead on again to a new revolution in the 21st Century). However, this real breakthrough of an achievement was not acknowledged by a Nobel Prize Award. The V-A theory would later form the foundation for the electroweak interaction theory. George Sudarshan himself regarded the V-A theory as his finest work to date. Later, it was successfully subsumed under the electroweak interaction unification theory by Sheldon Glashow, Abdus Salam and Steven Weinberg that would go on to win for the official 'threesome' the 1979 Nobel Prize in Physics. Curiously, the Sudarshan-Marshak (or V-A theory) was assessed, preferably and favourably, as "beautiful" by J. Robert Oppenheimer, only to be disparaged later on as "less complete" and "inelegant" by John Gribbin. George Sudarshan currently holds the record of the most nominated Nobel Prize candidate alive who has yet to receive any Nobel Prize.
- Chien-Shiung Wu 吴健雄 (nicknamed the "First Lady of Physics") disproved the law of the conservation of parity (1956) and was the first Wolf Prize winner in physics. She died in 1997 without receiving the Nobel. Wu assisted Tsung-Dao Lee 李政道 personally in his parity laws development – with Chen Ning Yang杨振宁 – by providing him with a possible test method for beta decay in 1956 that worked successfully. Her book Beta Decay (1965) is still a sine qua non reference for nuclear physicists.
- In 1964, George Zweig, then a PhD student at Caltech, espoused the physical existence of *aces* possessing several unorthodox attributes at a time which was very 'anti-quark'. Zweig consequently suffered academic ostracism and career path blocks from the scientific community of 'mainstream orthodoxy'. Despite the 1969 Nobel Prize awarded for contributions in the classification of elementary particles and the 1990 Nobel Prize for the development and proof of the quark model, Zweig's true dimension and size of his original contributions to the quark model story have largely gone unrecognized. Israeli physicist Yuval Ne'eman, who published the classification of hadrons through their SU(3) flavour symmetry independently of Gell-Mann in 1962, also felt that he had been unjustly deprived of the Nobel prize for the quark model.
- The 1974 prize was awarded to Martin Ryle and Antony Hewish's pioneering research in radio astrophysics; Hewish was recognized for his decisive role in the discovery of pulsars though he did not come up first with the correct explanation of

pulsars: having described them as communications from "Little Green Men" (LGM-1) in outer space. An answer was given by David Staelin and Edward Reifenstein, of the National Radio Astronomy Observatory in Green Bank, West Virginia, who found a pulsar at the center of the Crab Nebula: that pulsars are neutron stars, leftovers from a supernova explosion had been proposed in 1933. Soon after the discovery of pulsars in 1968, Fred Hoyle and astronomer Thomas Gold came up with the correct explanation of a pulsar as a rapidly spinning neutron star with a strong magnetic field, emitting radio waves much as a lighthouse did with its lamp. Jocelyn Bell Burnell, Hewish's graduate student, was not recognized, although she was the first to notice the stellar radio source that was later recognized as a pulsar. Pulsars are a group of astronomical objects that provide scientists with the first signs of the possible existence of gravity waves. In addition, rotating binary pulsars are also found to be reliable sources for putting Einstein's relativity theories to the most stringent of tests. While the astronomer Fred Hoyle argued that Bell should have been included in the Prize, Bell herself has stated that "I believe it would demean Nobel Prizes if they were awarded to research students, except in very exceptional cases, and I do not believe this is one of them." Research students who have received Nobel Prizes include Louis de Broglie, Rudolf Mössbauer, Douglas Osheroff, Gerard 't Hooft, John Forbes Nash, Jr., John Robert Schrieffer and H. David Politzer.

- The 1978 Nobel Physics Prize was awarded for the chanced "detection of cosmic microwave background radiation". The winners, Arno Allan Penzias and Robert Woodrow Wilson, initially did not comprehend the implications of their findings. Many scientists felt that Ralph Alpher, who predicted the cosmic microwave background radiation and in 1948 worked out the underpinnings of the Big Bang theory, should have shared in the prize or independently received one. There are many unproven theories why his work was ignored. In 2005, Alpher received the National Medal of Science for his pioneering contributions to our understanding of nucleosynthesis, the prediction of the relic radiation from the Big Bang, as well as for a model for the Big Bang theory.
- Although the winner William Alfred Fowler acknowledged Hoyle as the pioneer of the concept of stellar nucleosynthesis, he did not receive a share of the 1983 Nobel Prize in Physics although the Royal Swedish Academy of Sciences later made partial amends by awarding Hoyle, with Edwin Salpeter, its 1997 Crafoord Prize ".
- Other arguably controversial exclusions include Kan-Chang Wang 王淦昌 (discoverer of the anti-sigma minus hyperon (1959), first Paper on the Detection-of-Neutrino Experiment), Arnold Sommer-feld, Satyendra Nath Bose (Bose–Einstein condensate (BEC)), George Gamow, Ralph Alpher and Robert Herman (seminal (CBR) Cosmic microwave background radiation theorists) and Igor Dmitriyevich Novikov, with A. G. Doroshkevich (author of the first Paper for the Possible Detection of CBR), Bruno Pontecorvo (neutrino oscillations hypothesis, among others) and Robert Oppenheimer (first precursor Paper on the 'quantum tunnelling' phenomenon (1927–28), first prediction of the antimatter positron existence (1930), and neutron stars breakthrough seminal studies, mentor, "father of the atomic bomb", among others).

End Notes

1) Unless otherwise stated, the information about the Nobel Prizes is based on Wikipedia, the free encyclopedia.
2) There are other articles, by authors such as Frank J. Tipler [24], who claimed, *"The history of the physics prize is dotted with slights to those who deserved it and honors to those who didn't,"* and Ph. M. Kanarev [45], who claimed that many ignored errors in physics. The references are provided for those who are interested.
3) The importance of the non-existence of dynamic solutions for the Einstein equation [4], was soon recognized by MIT Institute Professor P. Morrison. Then, he started to discuss with me in details for about a month before he went to Princeton several times to discuss with Joseph Hooton Taylor, Jr. on the issue of dynamic solutions. Finally, Taylor informed Morrison that he should really discuss with Damour who did the calculation. Another outstanding physicist who did not object to the nonexistence dynamic solution is Daniel Kulp, Editorial Director of the American Physical Society, who happens to also have a degree in pure mathematics. Such an error was crucial in the failure to understand Einstein's unification [46, 47], and thus many physicists incorrectly regarded the experimental research on the weight reduction of charged capacitors [69, 70] as invalid.
4) D. Christodoulou, Ph.D. (1971) in Physics, Princeton University, Advisor John A. Wheeler, who also failed [7, 8] crucial calculations at undergraduate level [13].
5) Note that, the Shaw Prize is also not competent on Astrophysics. For instance, in 2008, a Shaw Prize for Astrophysics was awarded to Reinhard Genzel "in recognition of his outstanding contributions in

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demonstrating that the Milky Way contains a supermassive black hole at its centre". However, Genzel only claimed, "… must indeed be a massive black hole, beyond any reasonable doubt." In other words, Genzel is not 100% sure. Theoretically, the notion of black holes is based on the simulation with the implicit assumption that the attractive gravity would increase as energy increases [42]; but has not been established theoretically [56]. Moreover, this implicit assumption has been proved incorrect because of the discovery of the charge-mass interaction [16, 69].

6) In his inaugural speech, the New MIT President Dr. L. Rafael Reif, who follows the insight of former MIT President Susan Hockfield, heralds basic research, and proclaimed, "We all know that the consequences will be profound, for both education and research, but none of us knows how this story will end. We have two choices: to take part and try to shape it, or to watch from the sidelines as it evolves. The MIT I know loves challenges. The MIT I know solves the unsolvable, shapes the future, and serves our nation and the world. The MIT I know and love does not stand on the sidelines." He further remarked, "*If a society gives up on basic research, it is giving up on its future*. So it will be my job - and our shared responsibility - to argue forcefully, effectively and publicly for retaining robust investment in fundamental research, and to remind ourselves, and our nation, of its importance and value."
7) As Richter [70] pointed out, some cover up ignorance by treating theoretical physics as if a sect of religion. Moreover, some practice "authority worship" involuntarily because of certain ignorance of their time. However, as Einstein asserted [42, p. 60], "Unthinking respect for authority is the greatest enemy of truth".
8) NASA's discovery of the pioneer anomaly would change the absolute faith on general relativity, some theorists would be willing to re-examine the invalidity of linearization to understand the Hulse-Taylor experiments.
9) A well-known problem is NASA's discovery of Pioneer Space- Probe Anomaly. Recently, it was claimed that this problem has been resolved by a heat-radiation model. However, Erik Anderson (April 1, 2011 at 12:57) a discoverer of the anomaly commented, 'I take the opposite viewpoint of Paul and Daniel. Science will have suffered the worst sort of dysfunction if the Pioneer Anomaly gets swept under the convenient rug of "the plausible." Even so, we will still have the Earth flyby anomalies and the so-called "A.U." anomaly left uncovered. All three anomalies seem to be manifestations of a singular phenomenon-the latter two cannot be dismissed as heat radiation. Heat- radiation models, like string theory, can be customized to fit any set of observational parameters. There is no limit on sophistication. We should not be so easily impressed. Nothing has been resolved.'
10) Many of my teachers were graduates of Princeton University; such as Prof. A. J. Coleman, who pointed out errors of Einstein, and Prof. I. Halperin, who was my advisor for my M.Sc. & Ph.D. in mathematics.

References Références Referencias

1. Y. Lo, Einstein's Radiation Formula and Modifications in General Relativity, The Second William Fairbank Conference, Hong Kong Polytechnic, Hong Kong Dec. 13-16 (1993).
2. The Press Release of the Nobel Prize Committee (The Royal Swedish Academy of Sciences, Stockholm, 1993).
3. A.Gullstrand, Ark. Mat. Astr. Fys. 16, No. 8 (1921); ibid, Ark. Mat. Astr. Fys. 17, No. 3 (1922).
4. C. Y. Lo, Einstein's Radiation Formula and Modifications to the Einstein Equation, Astrophysical Journal **455**, 421-428 (Dec. 20, 1995); Editor S. Chandrasekhar, a Nobel Laureate, suggested and approved the Appendix.
5. C. Y. Lo, Phys. Essays **13** (4), 527-539 (December, 2000).
6. C. Y. Lo, Astrophys. Space Sci., **306**: 205-215 (2006) (DOI 10.1007/s10509-006-9221-x).
7. C. Y. Lo, Linearization of the Einstein Equation and the 1993 Press Release of the Nobel Prize in Physics, in Proc. of 18 th Annual Natural Philosophy Alliance Conf., Vol. **8**, 354-362, Univ. of Maryland, USA. 6-9 July, 2011.
8. C. Y. Lo, Comments on the 2011 Shaw Prize in Mathematical Sciences, an analysis of collectively formed errors in physics, GJSFR Vol. 12-A Issue 4 (Ver. 1.0) (June 2012).
9. C. Y. Lo, GJSFR Volume 13-A Issue 2 Version 1.0, (April 2013).
10. Carroll, Sean. *An Introduction to General Relativity: Spacetime and Geometry* (San Franc., Addison Wesley, 2003).
11. Christodoulou and S. Klainerman, ***The Global Nonlinear Stability of the Minkowski Space*** (Princeton University Press, 1993).
12. R. M. Wald, ***General Relativity*** (The Univ. of Chicago Press, Chicago, 1984).
13. C. W. Misner, K. S. Thorne, & J. A. Wheeler, ***Gravitation*** (Freeman, San Francisco, 1973).
14. 't Hooft, "A CONFONTATION WITH INFINITY", Nobel Lecture, December, 1999.
15. C. Y. Lo, The Invalid Speculation of $m = E/c^2$, the Reissner-Nordstrom Metric, and Einstein's Unification, Phys. Essays, **25** (1), 49-56 (2012).
16. C. Y. Lo, Astrophys. J. **477,** 700-704 (March 10, 1997).

17. C. Y. Lo, Bulletin of Pure and Applied Sciences, **25D** (1), 41- 47 (2006).
18. C. Y. Lo, Chin. Phys. (Beijing), **16** (3), 635-639 (March 2007).
19. C. Y. Lo, Rectifiable Inconsistencies and Related Problems in General Relativity, Phys. Essays, **23** (2), 258 (2010).
20. C. Y. Lo, A Counter Example of Einstein's Covariance Principle, **16th Annual Natural Philosophy Alliance Conference**, University of Connecticut, Storrs, May 25-29, 2009.
21. C. Y. Lo, Precession Formulas for Gravity Probe-B and its Complementary Experiment of Local Light Speeds, Bulletin of Pure and Applied Sciences, **28D** (1), 67-85 (2009).
22. C. Y. Lo, On Interpretations of Hubble's Law and the Bending of Light, Prog. in Phys., Vol. 1, 10-13 (Jan., 2006).
23. C. Y. Lo, On Criticisms of Einstein's Equivalence Principle, Phys. Essays **16** (1), 84-100 (March 2003).
24. Frank J. Tipler, Is the Physics Nobel Prize Also Becoming a Joke? October 16, 2009 *pajamasmedia.com/.../is-the-**physics-nobel-prize**-also-becoming-a-joke/*
25. C. Y. Lo, Special Relativity, Misinterpretation of E = Mc^2, and Einstein's Theory of General Relativity, in Proc. IX Intern. Sci. Conf. on '**Space, Time, Gravitation,'** August 7-11, 2006, Saint-Petersburg, Russian Acad. of Sciences.
26. C. Y. Lo, Bulletin of Pure and Applied Sciences, **27D** (2), 149-170 (2008).
27. A.Pais, 'Subtle is the Lord .' (Oxford University Press, New York, 1996).
28. C. Y. Lo, Phys. Essays **13** (1), 109-120 (March 2000).
29. Volker Perlick, Zentralbl. f. Math. **827**, 323 (1996).
30. C. Y. Lo, Completing Einstein's Proof of E = mc^2, Progress in Phys., Vol. 4, 14-18 (2006).
31. C. Y. Lo, Phys. Essays **18** (4), 547-560 (December, 2005).
32. C. Y. Lo, Phys. Essays, **23** (3), 491-499 (Sept. 2010).
33. S. Weinberg, ***The Quantum Theory of Fields*** (Cambridge University Press, Cambridge, 2000).
34. C. N. Yang & R. L. Mills, Phys. Rev. **96**, 191 (1954).
35. Ron Shaw, Ph. D. thesis, Cambridge University (1955).
36. Zhou Pei-yuan, "Further Experiments to Test Einstein's Theory of Gravitation," Proc. of International Symposium on Experimental Gravitational Physics (Guangzhou, 3-8 Aug. 1987), 110-116 (World Sci., Singapore).
37. C. Y. Lo, Einstein's Principle of Equivalence, and the Einstein-Minkowski Condition, Bulletin of Pure and Applied Sciences, **26D** (2), 73-88 (2007).
38. A.N. Whitehead, ***The Principle of Relativity*** (Cambridge Univ. Press, Cambridge, 1962).
39. C. A. Y. Lo, Progress in Phys., Vol. 1, 10-13 (Jan., 2006).
40. J. Whitrow, ***"Edwin Powell Hubble"***, *Dictionary of Scientific Biography,* v.5 (New York, Charles Scribner's Sons, 1972), p.532.
41. J. D. Jackson, ***Classical Electrodynamics***, (John Wiley & Sons, New York, 1962).
42. K. S. Thorne, Black Holes and Time Warps (Norton, New York, 1994), p. 105.
43. A.Einstein, ***The Meaning of Relativity*** (1922) (Princeton Univ. Press, 1974).
44. C. Y. Lo, C. Wong, Bulletin of Pure and Applied Sciences, **25D** (2), 109-117 (2006).
45. Ph. M. Kanarev, Errors by the Nobel Committee, The General Science Journal. kanphil@mail.ru
46. C. Y. Lo, Bulletin of Pure and Applied Sciences, **26D** (1), 29 - 42 (2007).
47. C. Y. Lo, Phys. Essays **21** (1), 44-51 (March 2008).
48. C. Y. Lo, The Mass-Charge Repulsive Force and Space-Probes Pioneer Anomaly, **Physical Interpretation of Relativity Theory: Proceedings of International Meeting, Moscow, 6 – 9 July 2009 /** Edited by M. C. Duffy, V. O. Gladyshev, A. N. Morozov, P. Rowlands – Moscow: BMSTU.
49. Slava G. Turyshev, Viktor T. Toth, **148**, No. 1-4, 149-167 (December, 2009).
50. C. Y. Lo, On the Weight Reduction of Metals due to Temperature Increments, GJSFR Vol. 12-A Issue 7 (Ver. 1.0) (Sept. 2012).
51. A. Einstein, 'E = mc^2 (1946)' in ***Ideas and Opinions*** (Crown, New York, 1954), pp 337-341.
52. K. S. Thorne, ***Black Holes and Time Warps*** (Norton, New York, 1994), p. 105.
53. W. Pauli, ***Theory of Relativity*** (Pergamon Press, London, 1971).
54. A. Einstein, H. A. Lorentz, H. Minkowski, H. Weyl, ***The Principle of Relativity*** (Dover, New York, 1952).
55. C. Y. Lo, Phys. Essays, **22** (4), 543-546 (2009).
56. S. Weinberg, Gravitation and Cosmology (John Wiley, New York, 1972).
57. C. Y. Lo, Phys. Essays **12** (3), 508-526 (Sept. 1999).
58. A. Lorentz, Proc. K. Ak. Amsterdam 8, 603 (1900).
59. C. Ohanian & R. Ruffini, "Gravitation and SpaceTime" (Norton, New York, 1994).
60. M. Born, "The Born-Einstein Letters" (Walker, New York, 1968), p.125.
61. A. Einstein & N. Rosen, J. Franklin Inst. 223, 43 (1937).
62. A. Einstein, On the influence of Gravitation on the propagation of light, Annalen der Physik, 35, 898-908 (1911).
63. Norton, "What was Einstein's Principle of Equivalence?" in Einstein's Studies Vol.1: ***Einstein and the History of General Relativity***, Eds. D. Howard & J. Stachel (Birkhäuser, Boston, 1989).

64. K-Y. Chung, S-w. Chiow, S. Herrmann, S. Chu, and H. Müller, Phys. Rev. D **80**, 016002 (2009).
65. C. Y. Lo, Local Lorentz Invariance and the Distortion of Einstein's Equivalence Principle, GJSFR Volume 12-A Issue 8 Version 1.0 (November 2012).
66. L. Synge, ***Relativity: The General Theory*** (North-Holland, Amsterdam, 1971), pp. IX–X.
67. C. M. Will, "***Was Einstein Right?***" (Basic Books, New York, 1986), p. 20.
68. V. A. Fock, ***The Theory of Space Time and Gravitation*** (Pergamon Press, 1964). The Russian edition was published in 1955 as part of the mud throwing campaign to discredit Einstein, after his death.
69. Doyle R. Buehler, *J. of Space Mixing* **2** (April, 2004) 1-22.
70. C. Y. Lo, Phys. Essays, 25 (1), 49-56 (2012).
71. B. Richter, Physical Sciences, Stanford University, "Theory in Particle Physics: Theological Speculation Versus Practical Knowledge," Phys. Today, 59(10), 8 (October 2006).