Date:	Wed, 5 Sep 2007 23:02:28 +1000 (EST)
From:	"Stephen Crothers" <thenarmis@yahoo.com> 🎦 Add to Address Book</thenarmis@yahoo.com>
Subject:	🖉 Re: wave packets
To:	☺ "C. Y. Lo" ≺c_y_lo@yahoo.com>, "Hooft 't G." ≺G.tHooft@phys.uu.nl>
CC:	"'anapier@tufts.edu'" <anapier@tufts.edu>, "'colemana@post.queensu.ca'" <colemana@post.queensu.ca>, "'cynthia.peterson@uconn.edu'" <cynthia.peterson@uconn.edu>, "jdsacdis@uiuc.edu'" <jdsacdis@uiuc.edu>, 😌 "S. L. Cao" <caosl20@yahoo.com.cn>, "SJ. Chang" <s-chang@uiuc.edu>, "M. Chubey" <mchubey@gao.spb.ru>, 😌 "ZuGan Deng" <zugan_deng@yahoo.com>, 😌 "Garret" <garret_sobczyk@yahoo.com>, "Gary R. Goldstein" <gary.goldstein@tufts.edu>, "Vladimir Gladyshev" <vgladyshev@mail.ru>, "T. D. Lee" <tdl@phys.columbia.edu>, "Piskaryev Lev Nikolaevitch" <pisar@cards.lanck.net>, 😌 "Liao Liu" liuliao1928@yahoo.com>, "Q "Chuen Wong" <ccwdkn@yahoo.com>, "c n yang" <cnyang@tsinghua.edu.cn></cnyang@tsinghua.edu.cn></ccwdkn@yahoo.com></pisar@cards.lanck.net></tdl@phys.columbia.edu></vgladyshev@mail.ru></gary.goldstein@tufts.edu></garret_sobczyk@yahoo.com></zugan_deng@yahoo.com></mchubey@gao.spb.ru></s-chang@uiuc.edu></caosl20@yahoo.com.cn></jdsacdis@uiuc.edu></cynthia.peterson@uconn.edu></colemana@post.queensu.ca></anapier@tufts.edu>

Dear Dr. Lo,

I note that once again the disingenuous Mr. 't Hooft is shooting off his inept mouth.

Here is an interesting paper by Weyl showing that the process of linearisation is nonsense because it implies the existence of a tensor which cannot exist.

www.geocities.com/theometria/weyl-1.pdf

Here is a paper by Levi-Civita which shows that Einstein's arguments for gravitational waves on the basis of the properties of his pseudo-tensor are utter nonsense, because Einstein's pseudo-tensor implies the existence of a 1st order intrinsic differential invariant which depends only upon the components of the metric tensor and its 1st derivatives, but the pure mathematicians proved in 1901 (Ricci and Levi-Civita) that such invariants do not exist!

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Mr. 't Hooft speaks of the so-called Schwarzschild radius, ignorant of the fact that it is merely a radius of curvature by virtue of its formal relationship to the Gaussian Curvature, ignorant of the fact that the radius of curvature in Einstein's gravitational field is not the same as the radial geodesic distance, ignorant of the fact that a geometry is entirely determined by the form of its line-element, ignorant of the fact that the usual "Schwarzschild" solution is not even Schwarzschild's solution but a corruption of Schwarzschild's solution and that Schwarzschild's true solution precludes black holes and such other nonsense. Attached is a paper that explains all this from 1st principles.

Yours faithfully, Stephen J. Crothers.

--- "Hooft 't G." <G.tHooft@phys.uu.nl> wrote:

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Subject:	Re: black holes
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CC:	😔 "'C. Y. Lo '" ≺c_y_lo@yahoo.com≻

Mr. 't Hooft,

Spoken yet again as a true champion of stupidity and ineptitude.

It is quite plain that you have no understanding of the geometrical nature of a spherically symmetric metric manifold. These comments you offer testify to that in no uncertain terms. You offer no technical proof of where you think my geometry is faulty, just unsubstantiated assertions. That will not do in the real world.

Also, Schwarzschild did not replace r - 2M by r as you assert. Indeed, he did not even make the association with M that you use. This is plain in his original paper, which you either have not read, or read but did not understand. In the alternative you have resorted to lie: the ever faithful servant of the huckster and blithering idiot with an ulterior motive.

Hawking and Ellis? You can't be serious. Those numbskulls think that the Michell-Laplace dark body is some kind of black hole (see their Large Scale Structure of Spacetime). They also think that black holes can collide, merge, or be components of binary systems. That is childish nonsense. Even if black holes are predicted by General Relativity, they cannot merge, collide or be components of binary systems, because the absurd black hole is derived from $R_{ij} = 0$ (i,j, = 0,1,2,3) which is a statement that there is no matter or energy outside the source of the gravitational field. But black holes are precluded by General Relativity to begin.

't Hooft, you are a liar, a scoundrel, a fraudster, and a hypocrite. You ridicule others and abuse them and are indignant when you are given a dose of your own filthy medicine. No thinking scientist takes you seriously. You arbitrarily suppress papers, in your new capacity as Editor of the Foundations of Physics journal. You maintain a website wherein you vilify one Prof. M. W. Evans (it does not matter if his work is right or wrong, you have no right to vilify him in this asinine way), you are so egocentric that you have busts and portraits made of yourself and post images of them on your website to satisfy your arrogant and all consuming desire for self-aggrandizement, and you cannot even to geometry into the bargain.

You have also ignored Weyl and Levi-Civita on the issue of gravitational radiation. That does not help you. It only reaffirms your ignorance and your intention to distort the facts.

Finally, I don't give one rats arse if you block my email address. I don't want email from the likes of you either, inevitably destined for the dustbin of scientific history. And being a vulgar working class man I am content with my working class vulgarity, so I freely use accurate common parlance unashamedly.

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freely use accurate common parlance unashamedly.

Crothers

Re: Your_manuscript DJ10048 Lo

Inbox X

Reply to all

Forward

Reply by chat Filter messages like this Print Add to Contacts list Delete this message Report phishing Report not phishing Show original Show in fixed width font Show in variable width font Message text garbled? Why is this spam/nonspam?

C. Dear Dr. Weinberg: Thank you very much for your email and May 1 (3 days the information the... ago)

C. Y. LoLoading... May 1 (3 days ago)

C. Y. Lo to prd, 't, anapier, Richter, Cao, show Chang, Chau, Chubey, colemana, Stephen, Jan, details ZuGan, fsmarandache, Garret, Gary, Vladimir, May 1 (3 jdsacdis, kerson, Lee, Piskaryev, Liao, Dmitri, Lisa, days ago) Vladislav, Henry, Chuen

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Since your journal in the field of general relativity is out-dated for many years, it is probably very difficult to catch up in a few months. Thus, in this sense, you have made the correct decision of not considering my paper further.

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My lack of confidence of your referee is based on facts after the submission. In addition, I have gone through this "standard" treatments not just once. You may wonder why I keep submitting papers to such journals. It is simply that this is

probably the only way to make a wake up call to such standard theorists. Moreover, since they are now dominating the field, I do not have to worry that somebody else publish my results first.

You may ask why I have such confidence on my paper. The answer is simply that nobody has been able to pointed out any deficiency on my paper so far. What I have received so far, are disagreements without a necessary scientific reason. When my paper is published, I will send you a copy.

Sincerely yours,

C. Y. Lo <u>prd@aps.org</u> wrote: Dear Dr. Lo:

I am writing in response to your most recent emails concerning your manuscript DJ10048.

The previous manuscript to which the referee was referring was the one that you submitted in 2005, not the one that you submitted in February 2008. Indeed, from the correspondence over the past several months, it should have been clear to you that your February 2008 submission had not been sent to a referee.

This manuscript is rejected, and we will not consider any further revision of it.

Since you have so little confidence in the competence and honesty of the editors and referees of this journal, I would suggest that you send your manuscripts elsewhere in the future.

Sincerely,

Erick Weinberg Editor Physical Review D

Stephen Crothers to Lo, prd, 't, anapier, Richter, Cao,
Chang, Chau, Chubey, colemana, Stephen, Jan,
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details
May 1 (3
days ago)

Reply

Dear Dr. Lo,

This result is of course no surprise to the thinking international scientific community. Physical Review D has long been recognised as a rag for the publication of nothing but that which supports the Standard Model, despite how asinine the arguments it publishes. The Gate-keepers of the Standard Model deliberately suppress anything that brings their Model into question. That is how science is done by the Standard Modellers. Free scientific discussion is outlawed by the Standard Modellers, not just in their "journals" but also in their electronic archives and their conferences. They will not admit any paper into their rounds that raises legitimate questions as to their theories, by which they make, I might add, much money now, one way or another. I recall that 't Hooft actually issued a warning (I too have retained 't Hooft's email as evidence thereof, if he ever attempts to deny it) to E. Weinberg (Editor, Physical Review D) some time ago, against publishing anything you submit. So it does not matter what your papers contain, Physical Review D will not publish any of them, if for no other reason then deference to "t Hooft.

Yours faithfully, Steve Crothers.

C. Y. Lo to me, prd, 't, anapier, Richter, Cao, Chang, Chau, Chubey, colemana, Stephen, Jan, ZuGan, fsmarandache, Garret, Gary, Vladimir, jdsacdis, kerson, Lee, Piskaryev, Liao, Dmitri, Lisa, Vladislav, Henry Reply

Dear Steven:

It is very difficult for me to believe that Professor 't Hooft actually said this since his image to me is a very good gentleman. Although we disagree in scientific issue, I have never had any doubt on his characters.

In science, it is usual that people keep the old thinking until a new experimental fact confronted them. So, perhaps you should be easier in your criticisms of the "standard" theorists. In any case, we are in the 21 century and lots of things have improved since the time Galileo. There are journals that do not agree with the "standard theory".

Moreover, the Internet has made the days of monopoly in publications by certain journals have over. Nobody can keep the lids for very long. More important, new experimental facts have come out, and thus no matter who is the gate keeper, the complete bankruptcy of the standard theory is very near. It is interesting that you regard the role played by Professor E. J Weinberg was the role of the Pope in the 16 century.

Nevertheless, we should keep knocking the gate until the scientific community is aware of the problem. Then, the physics community would force the gate open, After all, if Galileo can do it in the 16 century, there is no reason that this cannot be done in the 21 century.

Best regards.

Florentin Smarandache to me, Lo, prd, 't, anapier,
Richter, Cao, Chang, Chau, Chubey, colemana,
Stephen, Jan, ZuGan, Garret, Gary, Vladimir,
Jdsacdis, kerson, Lee, Piskaryev, Liao, Dmitri, Lisa,
Vladislav, Henryshow details
May 2 (2
days ago)Reply

Maybe all you might be interested in reading my letter about injustice in science, see it attached.

Florentin Smarandache

- Show quoted text -

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now.<http://us.rd.yahoo.com/evt=51733/*http://mobile.yahoo.com/;_ylt=Ahu06i62sR
8HDtDypao8Wcj9tAcJ>
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Injustice in Science, Arts, and Letters.doc

International Injustice in Science, Arts, and Letters

Florentin Smarandache

Chair of Math & Sciences Department

University of New Mexico, Gallup, NM 87301, USA

E-mail: smarand@unm.edu

In the scientific research, it is important to keep our freedom of thinking and not being yoked by others' theories without checking them, no matter where they come from. *Cogito, ergo sum* [I think, therefore I am], said Descartes (1596-1650), and this Latin aphorism became his first principle in philosophy.

Inspired by D. Rabounski [1] and M. Apostol [2] I read more articles about injustices in science (for example [3]) and in arts and letters occurring in contemporary societies.

Other than Descartes, we can also learn from Kant, who is perhaps the greatest 'natural' philosopher, with his famous phrase :"Have the courage to use your own reason!" (in Latin *sapere aude*!). Needless to say, to become a scientist one shall be dare to stand for the truth, even if it means to face the 'clamor of Boetians' (Gauss). A particular good example for this view is Galilei or Copernicus who defended 'heliocentric' system despite excessive pressure.

The poet Plautus (254-184 B.C.) had once exclaimed that *homo homini lupus* [man is a wolf for man], so people make problems to people.

In this short letter to the editor, I would like to list some inconvenient cases that manifest today:

There exist reviewing and indexing publications and institutes made just for a propagandistic way, and not reviewing all relevant literature on the topics, but reviewing their people and their ideas while ignoring, boycotting, denigrating, or discrediting other people and ideas.

They exercise an international traffic of influence by manipulation and falsification of information (such as biographies, history of events, etc.), discourage people for working on topics different from theirs, and use subversive techniques in their interest of hegemony in science, arts, and letters.

The science, art, and literature of the powerful are like that: If you don't cite them, it is your fault as if you have not read them. However, if they don't cite you, it's your fault too as if you did not deserve to be cited because you have published in so-called by them "obscure publications", even if these people have "borrowed" your idea without acknowledgement. They categorize as "obscure, unimportant, not mainstream" those journals, publishing houses, cultural centers and researchers or creators that do not obey to them or that dare to be independent thinkers, in order that these people with power positions stigmatize them in the public's eye (because they can not control these publications). While the publications and centers of research they control they proclaim as "the best".

The science/art & letters establishments continue to ignore or minimalize the research and creation done outside the mainstream.

It became a common procedure that people who control the so-called "high" publications abuse their power and they "take" ideas from less circulated publications and publish them in these "high" publications without citation, as their own ideas!

There are journals using hidden peer-reviewers that delay the publication until someone else from their house get credit for your paper's ideas.

Secret groups and services ignore and even boycott personalities who are independent in thinking and don't follow the mainstream or don't obey to them; they manipulate national and international awards in science, arts, literature, also they manipulate university positions, high research jobs, funding; they try to confiscate the whole planet's thought by making biased so-called "reference sites" (as the self-called "encyclopedias", "dictionaries", "handbooks", etc.) where they slander independent thinkers, while blocking other sites they don't like; that's why the whole human history of science, arts, letters has to be re-written;

the search engines bring these "reference sites" amongst the first pages in a search, even they are not the most relevant to the search topic, and since most of the hurry readers browse only the beginning pages [they don't spend time to look at all of them], it is a high probability that the populace is manipulated according to the biased information of these so-called "free" [just because they are not free!] reference sites;

these groups try to confiscate the Internet at the global scale;

always, during history, there were and unfortunately there still are intentions from some secret groups or services to dominate others...

They try to transform other countries in spiritual colonies by brain washing.

Secret groups and services do not only politic, economic, or military espionage, but also scientific, artistic, literary manipulations in the profit of their people.

Unfortunately, big cultures continue to destroy small cultures and to delete the collective memory of small nations. History is written by winners, says the aphorism, but this is not correct, history should be written by all parts.

International organisms are created who unfortunately only serve the interests of a few powers, not of the whole world.

There are people believing they detain the **absolute truth**, and if somebody dares to have a different opinion from them, he or she is blacklisted, slandered, banned from various publications, etc.

The public opinion is provoked, manipulated through propaganda, publicity, dissemination by those who detain the power or control the mass media and the national and international awards, and these awards have been created in purpose to impose some people and ideologies.

There exist scientific, artistic, literary, or cultural associations/organizations whose hidden goal is to manipulate people in their propagandistic interest and indoctrinate them. The literature they start to send (after collecting your membership money!) reflects only their ideas and praise only their people, while ignoring or boycotting others'. *Nolens volens* [unwilling or willing] the "member" of such association becomes their spiritual slave. Consequently, you are yoked to this association's propaganda.

Better to be independent and not belonging to any association/organization.

Acknowledgement:

The author would like to express his gratitude to V. Christianto, D. Rabounski, M. Apostol, E. Goldfain for their comments.

References:

- 1. D. Rabounski, Declaration of Academic Freedom, Progress in Physics, Vol. 1, pp. 57-60, 2006.
- 2. M. Apostol, Comment on the Declaration of Academic Freedom by D. Rabounski, Progress in Physics, p. 40, Vol. 3, 2007.

3. Rochus Boerner, The Suppression of Inconvenient Facts in Physics, <u>http://www.suppressedscience.net/</u>, 2003.

Hooft, G. t to Florentin, Lo, prd, anapier, Richter, Cao, Chang, Chau, Chubey, colemana, Stephen, Jan, ZuGan, Garret, Gary, Vladimir, jdsacdis, kerson, Lee, Piskaryev, Liao, Dmitri, Lisa, Vladislav, Henry, Chuen

show details May 3 (1 day ago)

Reply

Dear Florentin,

I very well understand the concerns you have, and the impression you have, that gentlemen such as Crothers and Lo are being treated unjustly by the "mainstream" in science. It must seem odd that in spite of all the noises they make, none of the real scientist pay even the slightest of attention. The reason for this is very simple: their ideas are totally misplaced, and any of the scientists who care to take a close look at what they are doing reach the same conclusion. There are hundreds, perhaps thousands, of people in the category of Lo and Crothers. I do feel sorry for them, and sometimes I try to explain to them what I think the mistakes are that they are making. To no avail. They continue trying to get their papers published, fighting against referees. These referees usually conclude instantly that the papers cannot possibly be correct, but often they underestimate how deep the errors are rooted in the ways of thinking of these people, so their reports are too short and generate more and more anger.

Consequently, "mainstream science" is being accused of arrogance, trying to protect their pet theories "against the odds", and all those other awful things.

In reality, scientists know very well that our present understanding is not perfect, and they are very open minded towards new ideas and approaches. However, coming with a new idea is far less easy than those poor misguided souls appear to believe. Scientists have learned a lot from Galileao, Einstein, Dirac and many others. Good ideas, even if they would overthrow a lot of standard wisdom, are always treated with a warm wellcome, even if they are fairly improbable. The point is, they must be logically accurate and consistent. This is nearly never the case when ideas come from such belligerent outsiders. I am sometimes so naive as to go in discussion with them. Most of my colleagues are wiser than that, they ignore them and go on with their usual business.

Cordial greetings, Gerard 't Hooft

uzczerni@cyf-kr.edu.pl to t, Florentin, Lo, prd, anapier, Richter, Cao, Chang, Chau, Chubey, colemana, Stephen, ZuGan, Garret, Gary, Vladimir, jdsacdis, kerson, Lee, Piskaryev, Liao, Dmitri, Lisa, Vladislav, Henry, Chuen

show details May 3 (1 day ago)

Reply

Dear Prof. t'Hooft,

Let me dedicate to you the following quotation:

"Speak your truth quietly and clearly; and listen to others, even to the dull and the ignorant, they too have their story."

Do you really think they are wiser, after all?

With kind regards,

Jan Czerniawski

C. Y. Lo to t, Florentin, prd, anapier, Richter, Cao, Chang, Chau, Chubey, colemana, Stephen, Jan, ZuGan, Garret, Gary, Vladimir, jdsacdis, kerson, Lee, Piskaryev, Liao, Dmitri, Lisa, Vladislav, Henry, Chuen Reply

Dear Professor Hooft:

Thank you very much for sending me a copy of your letter to Professor Florentin. You are a gentleman since you are symphathetic to those being mistreated. Understandably, some of them are anger. I do not know how all the others feel, but I am certainly not anger. In fact, in a way, I am very grateful to those gate keeper because of their efforts I have the opportunity to do what I accomplished without the keen competition that could have happened. Moreover, they also provide me the crucial information or motivation to do good physics.

For instance, Dr. Eric J. Wienberg was very critical toward my work on supporting Einstein's interpretation of his formula E = mc2 being only conditionally valid, He demands an experimental verification even though electromagnetism clear shows that electromagnetic energy is not equivalent to mass as shown in my paper published in Astrophysical Journal (1997). His critical attitude forced me to think deeper. Consequently, I have discovered the fifth force (mass-charge interaction). This discovery is crucial to the unification of gravity and electromagnetism, and it ensures me to have a place in the histroy of physics. In fact, I have written a thank you letter to Dr. Weinberg for this.

Another good example is that a common error in Einstein's initial general relativity is the so-called "covariance principle". I also found that many still use it after I have proven it being invalid. This puzzle was clarified by the Royal Society that discovered the covariance principle is in conflict to Einstein's requirement on weak gravity. A board member explains that they believe there are genuinely measurable quantities that are gauge invariant. From my training in pure mathematics, I know immediately that this can only be a mathematical illusion. However, to convince others, I need a counter example. Fortunately, the deflection of light to second order provides a simple counter example. This finishes off the so-called covariance principle. Moreover, this proved that Professor Zhou Pei-Yuan is right and C. N. Yang (another Nobel Laureate) was wrong.

Another example is that I have shown that Einstein's equation of 1915 has no physical wave solution or dynamics solution and I published this paper in Astrophysical Journal (1995). In 2006, you show me an example of wave solution and claimed that I was wrong. However, upon close examination, your solution, though bounded, is not valid in physics. A basic problem is that you do not understand the physics of plane waves although most physicists understand it. Moreover, to dig deeper, I discovered you and your friends just like Professor Penrose do not understand the principle of

causality, a basic principle in science. (The paper that analyzes your example is still in the hand of a referee.) So, I have concluded that you are esentially a very good applied mathematician who understand little in physics.

I have important results published in very respectable jounals. These papers are certainly logically accurate and consistent. I am very happy for what I have achieved. However, I feel sorry for those that wasted their life in maintaining bubles because of their arrogance and ignorance. They comfort themselves by claiming to be the mainstreams and lablel their theories as the "standard thelry". This is absurd because being mainstream physics means nothing unless the physics is right. The label of the "standard theory" is a good manifestation that they are not sure about their theory; otherwise they should have called it the correct theory.

In any case, physics is decided by experiments. We will soon see futher who is right on many issues.

Regards.

Stephen Crothers to Lo, t, Florentin, prd, anapier, Richter, Cao, Chang, Chau, Chubey, colemana, Stephen, Jan, ZuGan, Garret, Gary, Vladimir, jdsacdis, kerson, Lee, Piskaryev, Liao, Dmitri, Lisa Vladislav, Henry	show details 12:40 PM (22 hours ' ago)	Reply
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't Hooft,

Yet again a piece of sophistry from you: the words of the "genius" talking to we cannibals.

I note that you have remained silent on your "warning" to Weinberg not to publish anything by Dr. Lo. I note that you are silent on the lies you told concerning Schwarzschild's actual solution. I also note that you have not offered any proof that the quantity 'r' appearing in your so-called "Schwarzschild solution" (which is not Schwarzschild's solution) is NOT the radius of Gaussian curvature of the spatial section. Since you consider yourself a "genius" and those who think you otherwise or disagree with you, "bad physicists" (according your website), it must surely be a simple matter for you, such a "genius", to prove that 'r' in your "Schwarzschild solution" is "*a gauge choice: it determines the coordinate r*", as you have claimed, in writing. Surely such a simple proof from you would prove you a "genius" and me a "bad physicist", once and for all. I therefore invite you, once again, to provide all persons on this mailing list with your proof that the quantity 'r' in the "Schwarzschild solution" is NOT the radius of Gaussian curvature of the spatial section. Should we all hold our breath, waiting for your proof? Given your tract record I recommend that everyone breathe freely.

Your appeal to the authority of the majority of the scientific community is fallacious. The majority believe there are black holes, big bangs and expansion of the Universe, all allegedly predicted by General Relativity. That these notions are demonstrably false from within the very framework of General Relativity is ignored by you and your "mainstream" fraternity. Not a single one of that community realises the significance of the Gaussian curvature of a spatial section, you included, as their writings testify and as your claims for 'r' (see above) in the "Schwarzschild solution" testify. Thus the black holers and big bangers are quite incompetent in geometry. According to you, persons such as I must be ignored because the black holers and big bangers do not listen to us. That is very convenient (and circular), but quite absurd. I recall that one black holer and big banger, a professor too (at Cambridge University, UK), claimed, in writing, that my scientific work must be ignored because I infected his computer with viruses I had squirreled away in the code of my website, for the purpose of wrecking havoc upon unsuspecting black holers and big bangers, like him. Your appeal to the authority of the "mainstream" is no less asinine.

Do you really think that your contemptuous, smug and belittling remarks, so often bereft of any offering of mathematical proof, is scientific method? It is a widespread technique employed by the incompetent, the mediocre, the members of the "mainstream" scientific community when confronted with facts which invalidate their claims, but it is far from scientific method. Now you call me a "gentleman": - that is a first, and disingenuous, since you don't really think of me as a gentleman any more than I think you gentlemanly. I regard you as a scoundrel. An impeccably dressed and eloquent footpad is a footpad no less.

Crothers.

Hooft, G. t to me, Lo, Florentin, prd, anapier, Richter, Cao, Chang, Chau, Chubey, colemana, show details Stephen, Jan, ZuGan, Garret, Gary, Vladimir, 2:23 AM (8 Reply jdsacdis, kerson, Lee, Piskaryev, Liao, Dmitri, Lisa, hours ago) Vladislav, Henry

Dear Gentleman Crothers,

Well, your overheated reaction came as no surprise. By my unnecessary response to Smarandache's mail I loaded this onto me, I know.

As for Weinberg, the only "warning" I gave him was in the form of a good advice, which I had to do because by adding my name in the cc, Lo had suggested that I supported his ideas, which is far from the case. He is mistaken in his own special ways. You are in yours. As for 'r' in Schwarzschild, any choice for the radial coordinate would do, but, in the spherically symmetric case, the choice that turns the angular distance into that of a sphere with radius r is the most convenient one. In physics, we call that a coordinate choice or gauge choice. Yes, if you keep this r constant, then the curvature in the angular directions indeed happens te be that of a sphere with radius r. It is that by choice. Not so anymore in the Kerr or the Kerr-Newmann solution though. There, people indeed have been using various kinds of coordinates. What's more, a local observer who does not know about the spherical symmetry of this space-time, would have a hard time measuring your "Gaussian curvature". The "lie" I told about Schwarzschld was actually an inaccuracy in my memory about what I remembered at that time from having read the paper long ago. I remembered that Schwarzschild had shifted the r coordinate (calling the one we use now R and the new one r, again, from what I remember now). But then I looked at the paper again and noted that the shift he actually introduced was $R^3 = r^3 + a^3$, not the one which I had thought of, R = r + a. Today, we replace a by 2GM. The reason for his particular way of shifting can also be understood, if I remember well (I presently don't have Schwarzschild's paper in front of me, but never mind). Schwarzschild had been working not with Einstein's complete set of equations, but with a simplified version, which amounts to the same provided \Sqrt(g) is kept equal to one. So, the volume factor had to stay the same. The shift he made added a constant to the volume within r. Schwarzschild could not have known the subtle nature of the horizon, but you should know it, since it is all in the text books now.

As for scientific responses, I have tried these many times, in vain, to you and Mr. Lo. I will now proceed to a non-scientific, but much more effective method: use my patient and all-absorbing spam filter.

G. 't Hooft.

C. Y. Lo to t, me, Florentin, prd, anapier, Richter, Cao, Chang, Chau, Chubey, colemana, Stephen, show details Jan, ZuGan, Garret, Gary, Vladimir, jdsacdis, 6:07 AM (4 Reply kerson, Lee, Piskaryev, Liao, Dmitri, Lisa, hours ago) Vladislav, Henry

Dear Professor Florentin:

May I call your attention to the letter of Professor 'Hooft addressed to you. His letter tried to tell you that the scientists learned lots from Galileo, Einstein, Dirac, and many others. Nobody denies this, and this is why Steven Crothers and others appeal to the scientific community.

However, what Steven complained is to those in a small section of theoretical physics, in the field of gravitation. Surprising Professor Hooft did not mentioned a single example to defend those accused. Would this mean that he could not come up with an example or he has a problem in logic?

In either case, Professor Hooft has lots to learn both in physics and logic. It is amusing that Professor Hooft accused others of being illogical. In fact, he has more to learn in logic than average scientists. Thus, Professor Hooft actually allow himself to be an example of arrogance that you and Steve mentioned.

Florentin Smarandache to Lo, t, me, prd, anapier, Richter, Cao, Chang, Chau, Chubey, colemana, Stephen, Jan, ZuGan, Garret, Gary, Vladimir, jdsacdis, kerson, Lee, Piskaryev, Liao, Dmitri, Lisa, Vladislav, Henry	show details 7:05 AM (3 hours ago)	Reply
According to the freedom of speech I agree that		

According to the freedom of speech I agree that everybody should be allowed to express his/her ideas. Now in the Internet era it would be very hard, almost impossible, for somebody (no matter what position he/she has) to entangle the circulation and spreading of ideas.

Time and experiments would eventually judge all of us.

Florentin

L.S.,

Having had previous email encounters with this Mr. Crothers, I already know what kind of replies are to be expected from him; this mail is therefore primarily directed only to the sane recipients.

The answers to his questions are simple, and of course well known to all professional astronomers:

1. Crothers thinks that black holes cannot be surrounded by matter because they are solutions of the equation Ric=0. Of course this is nonsense. Einstein's equations are sufficiently robust to allow for all sorts of small perturbations. Stars, planets and gas clouds do carry gravitational fields of their own, and yes, they produce small corrections to the equations for a black hole, in the form of a right-hand-side to the equation Ric=Energy-momentum, and no, they do not affect the main feature of a black hole, which is the fact that it is surrounded by a horizon. They do affect the singularity at the origin in a way that is insignificant for astronomy, because the singularity is unobservable (Note that the singularity of the Kerr solution, which carries angular momentum, is different from the Schwarzschild one). Hawking and Penrose's theorems apply to the horizon, which in fact grows when matter is accreted. Black holes can be in the vicinity of other black holes. Again, gluing together these space-times implies small modifications of the solutions of the equations for all of these. Indeed the equations are too complex to be solved exactly, which of course does not affect the existence of such solutions. There have been numerous numerical investigations that provided series of more and more precise expressions for these solutions. Crothers suffers from a deeply rooted non-understanding of the mathematical nature of these equations, and the feature of horizon formation.

2. The claim that horizons don't exist because it takes an infinite amount of time to form them is a well-known misconception. It takes only a finite amount of time to form the region from where no signal can escape. Very soon during the earliest stages of black hole formation, the region is created where escape would require the presence of material flows that violate the energy condition. Observers do not need an infinite amount of time to establish that this situation has arisen.

3. The statement about "Gaussian curvature" is also nonsense, I'm afraid. Only in the exceptional case of perfect spherical symmetry, one can imagine concentric spheres with Gaussian curvature $1/r^2$, where r is the Schwarzschild r coordinate. But for any solution, even the spherical one, one can draw surfaces of S2 topology through any point in space-time, with any value of the Gaussian curvature, so from a physical point of view, Crothers' claim that r should refer to Gaussian curvature is meaningless. Of course, no astronomer in his right mind would claim that r stands for a spatial distance; physical radial distances would be defined by integrating the square root of $g_{\rm T}$, if ever needed. r is really nothing more than a conveniently chosen coordinate. This has been explained to Crothers by many people, so I do not have any illusion that he will understand it now.

4. Indeed, it would be unwise to try to observe the "central singularity" because you can't. No serious astronomer ever claimed that you can. But the region inside the horizon would be a (painful) reality for any observer venturing his way into the black hole.

Using telescopes on Earth it would be interesting indeed to observe gas flows spiralling into the horizon with locally defined velocities close to that of light, and that is what the investigators will be able to do. They will not see singularities.

O, yes, excerpts from my mail will probably emerge on some weblogs, drawn out of context and ornamented with comments. You may read those for your pleasure, or better just ignore.

Greetings, G. 't Hooft.

Mr. 't Hooft and I have indeed had previous encounters. I have reported these before. It is no secret that Mr. 't Hooft and I do not like one another. So what? That has no bearing on the science. His reference to sanity is just unscientific nonsense.

1) In Section 11, THE SCHWARZSCHILD SOLUTION, on page 39 of his INTRODUCTION TO GENERAL RELATIVITY (VERSION 8/4/02) (on his personal website) Mr. 't Hooft writes:

"Einstein's equation, (7.26), should be exactly valid. Therefore it is interesting to search for exact solutions. The simplest and most important one is empty space surrounding a static star or planet. There, one has

 $T_{\mu\nu} = 0$: (11:1)

If the planet does not rotate very fast, the effects of this rotation (which do exist!) may be ignored. Then there is spherical symmetry."

Thus the so-called 'Schwarzschild solution' is a solution for Ric = 0, an empty Universe, and has spherical symmetry. But Einstein's Principle of Equivalence and his laws of Special Relativity cannot manifest in a space-time that by definition contains no matter. That Einstein maintained that his Principle of Equivalence and his laws of Special Relativity must manifest in his gravitational field is indubitable. I have cited his detailed arguments from his book "The Meaning of Relativity". Since the Principle of Superposition does not apply in General Relativity, "Schwarzschild black holes" cannot persist in and mutually interact in a mutual space-time that by definition contains no matter. The introduction of vague things like "robust" and "small perturbations" doesn't alter that fact that Ric = 0 is an empty universe.

Mr. 't Hooft advocates "gluing together" the space-times of such "black holes". But that does not alter the fact that there are no known solutions to the field equations for the interaction of two or more bodies and that there is no existence theorem proven by which the field equations can be asserted to contain latent solutions for such configurations of matter. Before Mr. 't Hooft gets out his trusty glue stick he needs to first prove that the field equations contain latent solutions for such proposed configurations of matter. Without an existence theorem or an exact solution to the field equations, his glue and perturbations are just arbitrary ad hoc assertions, upon which one can conduct any amount of numerical analysis. The numerical analysis does not however in any way guarantee that it is dealing with a well-posed problem. By "gluing together" space-times Mr. 't Hooft has not proven that the field equations permit such arbitrary creations. With such a procedure one can make up just about anything. Moreover, General Relativity cannot account for the simple experimental fact that two fixed bodies will attract one another upon release.

- 2) Mr. 't Hooft has taken unjustified liberty with what I have argued about event horizons. I have made no remarks about the "*formation*" of event horizons. I have pointed out, as have many others before me, that it does take an infinite amount time for an observer to confirm the presence of the alleged event horizon. A simple calculation, which surely you must all know, proves this. My argument is correct. But since nobody has been and nobody will be around for an infinite amount of time, nobody will ever verify the alleged event horizon. Indeed, nobody has ever found an event horizon. Something that cannot be verified by its very definition is not physics.
- 3) Mr. 't Hooft is incorrect on Gaussian curvature. I have given proofs by first principles and by use of the well-known relation involving the Riemannian tensor and I have cited numerous sources for the basic mathematics. Here again:

Mr. 't Hooft says:

"Of course, no astronomer in his right mind would claim that r stands for a spatial distance..."

But that is not true. I have cited the writings of various astronomers and astrophysicists in my papers. Many if not most think that the said 'r' is a distance and even a radial distance in the manifold, and treat it as such. Now in Section 12. MERCURY AND LIGHT RAYS IN THE SCHWARZSCHILD METRIC of his INTRODUCTION TO GENERAL RELATIVITY, wherein he relies upon the so-called "Schwarzschild solution" and thus refers to the coordinate r, in relation to his equations (12.36) and (12.37), for a particular value of 'r', Mr. 't Hooft says:

"...where r_0 is the smallest distance of the light ray to the central source."

Also, Mr. 't Hooft concedes that my identification of the geodesic radial distance from the centre of spherical symmetry in the "Schwarzschild solution" is indeed given by the integral of the square root of the negative of the component of the metric tensor containing the square of the differential element of the square root of the coefficient of the angular terms (which I have correctly identified as the inverse square root of the Gaussian curvature of a spherically symmetric geodesic surface in the spatial section). He says:

"...physical radial distances would be defined by integrating the square root of g_{rr} , if ever needed."

Furthermore, I have reported accurately from Mr. 't Hooft's emails, contrary to his implications in the final remark in his current email. He certainly said of the quantity 'r' in the "Schwarzschild solution" that it is

"a gauge choice: it defines the coordinate r"

which is not correct. I reported the email exchange with Mr. 't Hooft here:

www.sjcrothers.plasmaresources.com/Hooft.pdf

and so can be verified by anybody willing to do so, instead of just taking Mr. 't Hooft at his word.

4) It is irrefutable that the Special Theory of Relativity forbids infinite density. The calculation is elementary. General Relativity cannot violate Special Relativity. The alleged "singularity" of the black hole is infinitely dense, in violation of the Theory of Relativity. And nobody has ever found an infinitely dense singularity anywhere.

Since neither the infinitely dense point-mass singularity nor the event horizon have ever been found, nobody has assuredly found a black hole anywhere, despite all the claims for their numerous discoveries.

I note that Mr. 't Hooft has been silent on the fact that Einstein's pseudo-tensor is a meaningless concoction of mathematical symbols, and that he has been silent on the fact that linearisation of the field equations is meaningless.

And let's not forget the fact that "Schwarzschild's solution" is not Schwarzschild's solution. Here again is Schwarzschild's paper:

www.sjcrothers.plasmaresources.com/schwarzschild.pdf

One cannot get a "black hole" from Schwarzschild's solution except by disfiguring it.

Steve Crothers 22/9/2008

't Hooft (Nobel Laureate) - v – Crothers (Home Gardener) July 2014

Demetris Christopoulos II 30.39 National and Kapodistrian University of Athens

Question

Can somebody solve the next problem by using only general relativity?

We have two absolutely equal masses m1=m2=m that are in a distance r12=r21=r away each other. The masses are in rest in the laboratory frame. According to General Relativity (GR) each mass leads to a space time curvature and creates a kind of 'dent' in spacetime, see for example next Figure:

https://www.researchgate.net/post/Can_somebody_solve_the_next_problem_by_usin g_only_general_relativity?cp=re65_x_p2&ch=reg&loginT=tHADFhxedrP8p_e66NM MUPLxUqw8KaUvy5lgxHVGFqU*&pli=1#view=53c4d7e9d4c118b0328b462e

Gerard t Hooft + # 33.92 + # 239.47 + Universiteit Utrecht

@Demetris: I was about to terminate my participation in the black hole blog (too many people shouting that 5+5=11, no matter what mainstreamers say), but you ask a plain question. It seems not to have been answered yet.

First, why do you think that no motion is produced? If r, r12 and r21 are vectors then you have to say, for instance, r21 = r2-r1 = r and r12 = r1-r2 = -r. Planet 1 is pulled to the right and planet 2 to the left. The 12 symmetry is perfect, but in replacing 1 by 2, the vectors change sign. You may have chosen the initial state as one where both masses are at rest, but as time goes on they don't stay in that state, they accelerate towards each other, still in total agreement with the 12 symmetry. Note that the dent produced by a 2 mass system is a bit more complicated than just two dents of single masses. Furthermore, their geodesics are a bit more complex due to the effect that they emit some gravitational radiation in the process (in most cases this is negligible). No violation of the 12 symmetry should be needed or expected. I'm not sure this answers your question.

There is no reason to put GR away as a religion, it's by far the most elegant way to reconcile gravity with relativity, and it did make quite a few predictions that were vindicated by observations, most notably on the Hulse Taylor double pulsar. GR has not (yet) been falsified by my knowledge.

Ω

Stephen Crothers + ⊯ 13.05 + ■ 5.52 + Alpha Institute of Advanced Study

Mr. 't Hooft said: "@Demetris: I was about to terminate my participation in the black hole blog (too many people shouting that 5+5=11, no matter what mainstreamers say), but you ask a plain question."

However, everything Mr. 't Hooft said in support of black holes on the 'black hole blog' is demonstrably false.

Mr. 'Hooft said: "*GR* has not (yet) been falsified by my knowledge. ... Conservation laws like baryon number are likely to be violated anyway, and energy, momentum and angular momentum stay conserved."

However, the usual conservation of energy and momentum for a closed system is actually violated by General Relativity, and so it is in conflict with a vast array of experiments. This violation is inextricably related to the unwitting invocation by Einstein and his followers of a first-order intrinsic differential invariant. But first-order intrinsic differential invariants do not exist. Since I invited Mr. 't Hooft on the 'black hole blog' to provide his 'proof' that first-order intrinsic differential invariants exist, I invite him again here to produce his attempted proof.

Gerard t Hooft + # 33.92 + # 239.47 + Universiteit Utrecht

@Crothers is asking me for a lecture in elementary gravitational dynamics. He can look up in my lecture notes how I do the calculation. I'll here only summarise very briefly:

Take the Einstein-Hilbert action, S_EH. Write the metric as g_munu = g^0_munu+g^1_munu. Here, g^0 describes the background, g^1 describes ripples on top of the background. Expand S_EH in powers of g^1. You get a Lagrangian for g^1.

(Note that for the background I only demand that it obeys Einstein's equations by itself; it does not matter how you choose it, it could even contain grav. waves itself)

g^{^1} must be such that it obeys its Euler-Lagrange equation (all of this is standard). We demand that g^{^0} also obeys the Einstein eq., so that consequently, all terms in the expansion of S_EH linear in g^{^1} do not contribute. You get equations quadratic in g^{^1} and higher. By adding total derivatives to the action, it is trivial to rewrite L such that it only contains first order partial derivatives of g^{^1}. This turns L into a useful Lagrangian of the standard form, except that you do have to add gauge constraints, since general coordinate transformations leave S_EH invariant. What remains is handled in a totally standard way, as we always do in particle physics. Split L up into a kinetic part T and a potential part V. Notice that you can go from the Lagrange formalism to the Hamiltonian formalism. Look up your notes for classical mechanics. The quadratic part in g^{^1} dominates so much that we can usually ignore the higher order terms, but at a later stage of the calculation, you add

these as well, to notice that, due to slight non-linearities, gravitational waves interact - this is logical, because these waves carry energy, and as such are sources of waves themselves.

The simple fact that we have a hamiltonian means that this hamiltonian is conserved in time: energy conservation. It is also an expression only containing first order derivatives. So, if I understand you well, here is the first-order intrinsic differential invariant you were looking for.

Note that energy is not exactly conserved if the background is time-dependent, as in any theory, so if you want energy conservation you should not put any time-dependent ripples in g^A0.

What you find is recognised in particle physics as the Lagrangian and the Hamiltonian of massless spin 2 particles, which we call gravitons. The symmetric 4x4 tensor g^A1 contains 10 locally independent components. Of these, 4 can be constrained to vanish by imposing gauge constraints in the 4 coordinates. Of the remaining 6 degrees of freedom, again 4 do not propagate, a situation similar to that in electromagnetism: the photon field A_mu has 4 components, 1 can be gauged to zero, and 1 does not propagate, so that also 2 physical degrees of freedom are left: the two helicities of the photon. The graviton also has two physical degrees of freedom: the two possible polarisations of the gravitational wave. These two field components are exactly as physical as electric and magnetic fields are.

Curiously, Newton's constant G_N has the right sign for the energy of gravitational waves to be positive. If G_N were negative, gravitational waves would carry negative energy.

The fact that we have massless equations means that gravitational waves move exactly with the speed of light, just as photons do. The above is a brief, qualitative description of the steps needed to do the calculation. I did the calculation explicitly, many times, so I know that it works just fine, but you do have to understand how gauge fixing works.

The interaction terms (of cubic and higher order in g¹) diverge if you have strictly, ideal planar waves, which would carry unbounded amounts of energy, but apparently that wasn't your problem.

I now really end my contribution to this discussion.

Gerard t Hooft + # 33.92 + # 239.47 + Universiteit Utrecht

@Demetris,

No, we disagree about GR. GR is completely computationally useful. Computer algorithms exist to determine the evolution from any initial state. You don't need any symmetries to prove the existence of solutions. Spherical and cylindrical symmetry are useful if you want analytically closed solutions. Any other solutions can be obtained by perturbation expansions and trial functions of all sorts.

I don't understand your question about 'rigid body notion'. We have invariance under general coordinate transformations. What great jump are you talking about? Of course we don't know everything, and exactly how to reconcile GR with QM at distance scales some 10^A-18 times the Standard Model scale, is not exactly known. Anything at larger distance scales is efficiently described by the classical EH action for spacetime curvature, and quantum field theory for the particles in there. Of course many particles may exist that cannot be detected with today's experimental techniques, so yes, questions remain. Our problem is that todays theories work so well that everything we can actually measure can be handled by them. The Lagrangians DO tell us unambiguously how things evolve.

Then, your question on 'linear science': After so many centuries of linear science are we still satisfied with this paradigm? Well, linearization, I would rather talk about differentiation, is indeed a very powerful tool in science. There's nothing wrong with this in principle. It is based on the notion that many features in space and time are based on *real numbers*. That's good as long as this description appears to be adequate. In practice, this is the case in 99.99% of all science done on this planet. However, I do suspect that in the Planckian regime, real numbers might not be the best approach anymore. We have to remember that real numbers are man-made inventions. Useful, but man-made. I do suspect that the ultimate laws of nature, defined to act in the Planckian regime, will not be based on real numbers. Not on rational numbers, not even on integers, but only on bits and bytes of information. But, one can say this, but as long as we don't know how to implement such thoughts, they are, well, just thoughts.

Stephen Crothers - # 13.05 - # 5.52 - Alpha Institute of Advanced Study

"t Hooft said: "@Crothers is asking me for a lecture in elementary gravitational dynamics."

Now that's another big fib 't Hooft, that's not what I asked you. As I said before what I say and what you claim I say are two very different things. I invited you to prove that first-order intrinsic differential invariants exist. You evaded the issue with your long post.

"t Hooft said: "The simple fact that we have a hamiltonian means that this hamiltonian is conserved in time: energy conservation. It is also an expression only containing first order derivatives. So, if I understand you well, here is the first-order intrinsic differential invariant you were looking for."

No, you don't understand. That's the problem. I therefore invite you to tell us all what you 'understand' is a first-order intrinsic differential invariant. So far you haven't presented anything that indicates you even know what it is.

Gerard t Hooft + # 33.92 + # 239.47 + Universiteit Utrecht

@Crothers, whatever it is, it is not affecting the reality of gravitational waves, because I derive the solution accurately, including the reason why grav waves move with the local speed of light and why they conserve energy while interacting with anything else. You are seeing, or searching for, ghosts. It's a weakness of mine that I want to know what goes on in your mind that bars your understanding of gravitational waves. They can be calculated through in as much detail as you want. But probably it is hopelessly pointless, you've been stuck at this point for years.

 \mathbf{T}

Stephen Crothers • II 13.05 • II 5.52 • Alpha Institute of Advanced Study

Well now 't Hooft, thankyou very much for finally admitting that you don't even know what a first-order intrinsic differential invariant is. I knew long ago that you don't even know what a first-order intrinsic differential invariant is. Have you forgotten our email exchanges some years ago? Since you don't know what a first-order intrinsic differential invariant is you don't know what a first-order intrinsic differential invariant is you don't know why there is a very big problem. You just blindly follow Einstein, who didn't know it either. That's the real reason why it's hopeless.

Since 't Hooft doesn't know what a first-order intrinsic differential invariant is, perhaps some proponent here of black holes, big bangs, and Einstein gravitational waves, etc. can help him out and explain it. The serial down-voter here is particularly invited to enlighten Mr. 't Hooft.

't Hooft, your calculations are nothing new, and so they are founded upon the very same fallacies.

Although there is an energy-momentum 'conservation law' in General Relativity, it violates the usual conservation of energy and momentum for a closed system and is therefore in conflict with a vast array of experiments, and so it also affects Einstein's alleged gravitational waves. Einstein's gravitational waves will never be detected because they don't exist; because his theory is based upon a mathematical fallacy.

You have heaped your derision upon me for years 't Hooft, on your website (http://www.staff.science.uu.nl/~hooft101 /gravitating_misconceptions.html), but I have not responded to it. But the time has now come for me to deal with you specifically.

Mr. C.

Gerard t Hooft + # 33.92 + # 239.47 + Universiteit Utrecht

@ Mr. C: Since when are Lagrange's and Hamilton's principles fallacies?

@Demetris: as soon as you have a Lagrangian, construct the Hamiltonian and check whether it's non negative. Gravity passes that check. Then, you're in business. No further problems (the check for gravity I'll leave as a bite for Crothers). @Demetris: everything becomes trivial if you linearise the equations (good for the first 20 or so decimal places) and fourier transform.

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Gerard t Hooft + # 33.92 + # 240.59 + Universiteit Utrecht

No such violations if you do things right ... No violation at all of the usual energy momentum conservation laws. Just can't happen if you apply the Hamilton procedure right. Not even if you shout as loud as you can ... I used all my patience to show to you how one solves the equations that lead to grav. waves. Why don't you exercise the patience, with your superior intellect, to explain to dummies like me where you feel your contradictions lie, and why Euler, Lagrange and Hamilton all fail here. I only encounter complete consistency, just as on other theories like Maxwell, Newtonian gravity with N bodies, and the like.

Stephen Crothers · II 13.05 · II 5.52 · Alpha Institute of Advanced Study

(1) 't Hooft said: "@ Mr. C: Since when are Lagrange's and Hamilton's principles fallacies?"

You have always been a disingenuous fellow 't Hooft, and a leopard never changes its spots. Cite where I said or even implied that the Lagrange and Hamilton principles are fallacies. You conveniently concocted this charge with your own wild imagination.

(2) 't Hooft said: "No such violations if you do things right ... No violation at all of the usual energy momentum conservation laws. Just can't happen if you apply the Hamilton procedure right. Not even if you shout as loud as you can"

This is not so. The reason why you don't understand is that, by your own admission now, you don't even know what a first-order intrinsic differential invariant is. Will no proponent here of black holes, big bangs, and Einstein gravitational waves assist Mr. 't Hooft on this matter? Taking into account the issue of first-order intrinsic differential invariants it follows that although there is a 'conservation law' in General Relativity, it is a 'law' which violates the usual conservation of energy and momentum for a closed system, and so General Relativity is in conflict with a vast array of experiments.

The only one shouting here 't Hooft is you. It seems your blood pressure is also out of control. Now you resort to additional childish derisive screams with your references to 'superior intellect' and to Euler, Lagrange and Hamilton (I refer you to (1) above). (3) t' Hooft said: "Why don't you exercise the patience, with your superior intellect, to explain to dummies like me where you feel your contradictions lie, and why Euler, Lagrange and Hamilton all fail here. I only encounter complete consistency, just as on other theories like Maxwell, Newtonian gravity with N bodies, and the like."

I have exercised patience with you 't Hooft for at least 4 years now since I have not said a word about your derisive webpage in all that time. However, as I said before, the time has come to deal with that directly. As for Euler, Lagrange and Hamilton I again refer you to (1) above.

(4) 't Hooft said: "I only encounter complete consistency, just as on other theories like Maxwell, Newtonian gravity with N bodies, and the like."

That's because you can't see even the simplest of inconsistencies. This is also the case with your arguments for the existence of black holes. To illustrate, please tell us what bound there is on asymptotic.

Gerard t Hooft + # 33.92 + # 240.59 + Universiteit Utrecht

Well then, Mr C, if this inconsistency is so simple as you say, try to explain it to me, don't tell others to do that. Frankly, I suspect I am not the only one who does not know what you are talking about.

Tell us all what invariant you do have in the Maxwell case. What I have there, is the stress-energy-momentum tensor T_munu. In case you might ask, yes, one can introduce just such a tensor for grav. waves, not everyone seems to realise this.



Stephen Crothers • II 13.05 • II 5.52 • Alpha Institute of Advanced Study

(1) 't Hooft said: "Well then, Mr C, if this inconsistency is so simple as you say, try to explain it to me, don't tell others to do that."

You're telling fibs again 't Hooft. I have never told anybody here to do anything. Cite where you allege I told people to do something. I in fact invited proponents of holes and bangs and waves to offer an explanation for you. But there were no takers.

(1) 't Hooft said: "Frankly, I suspect I am not the only one who does not know what you are talking about."

That's the only thing you've got right so far 't Hooft. All proponents of black holes, big bangs, Einstein gravitational waves, and General Relativity are in the same boat as you. First-order intrinsic differential invariants?

(2) 't Hooft said: "Tell us all what invariant you do have in the Maxwell case. What I have there, is the stress-energy-momentum tensor T_munu."

You haven't answered anything I've put to you, yet you expect me to answer everything for you. That's your commander proclivity at work again. I refer you to my previous post and my prior request to you; but I'll reiterate:

That's because you can't see even the simplest of inconsistencies. This is also the case with your arguments for the existence of black holes. To illustrate, please tell us what bound there is on asymptotic.

(3) Here is another instance of cosmological consensus fallacy: All proponents of big bang creationism claim that some big bang created the Universe and produced a Cosmic Microwave Background that is present as an isotropic remnant at 2.725 K blackbody. They claim that they have measured the temperature of the Universe and anisotropies in it. However, none of it is true:

Professor Pierre-Marie Robitaille: The Cosmic Microwave Background https://www.youtube.com/watch?v=i8ijbu3bSql

And so it is also in the case of black holes, big bangs, Einstein gravitational waves, etc.

 \mathbf{T}
Gerard t Hooft + al 33.92 + to 240.59 + Universiteit Utrecht

I'm afraid that I'll have to agree with @Crothers that our discussion is getting nowhere. I explained in as much detail as I can how gravitational waves are computed, why, in agreement with the Lagrange and Hamilton's principles the solutions are unique and unambiguous, and that they conserve energy and momentum in the usual fashion. Crothers nevertheless still sees inconsistencies in grav. waves, just as he sees them in black holes and big bangs everywhere. He is not inclined to explain to us "even the simplest of these inconsistencies".

As for black holes, he asks me "what bound there is on asymptotic" (sic). I have to guess what he means by that question. Indeed, as seen by an external observer, the black hole is an asymptotic state, approached exponentially fast by physical data such as field values, curvature distribution, remaining particles, etc. The decreasing exponentials do not stop approaching zero.

By turning to Kruskal coordinates (C has fundamental objections against them if I remember well), one can see that the dynamical variables of the system have absolutely no reason to modify these exponentials, make them turn around or something like that, simply because the physical final state is not singular in any way (the BH singularity is far away from the horizon, where no physical outside observer can see it). Thus the BH is a completely regular asymptotic state, just like that of a harmonic oscillator with a damping term added.

I should have stopped discussing with this person long ago.

Stephen Crothers • # 13.05 • # 5.52 • Alpha Institute of Advanced Study

(1) 't Hooft said: "He is not inclined to explain to us 'even the simplest of these inconsistencies'."

This is another fib 't Hooft. It seems you just can't help yourself. Until now you have not answered anything I put to you, yet you crow that I am not inclined to explain. This is the standard 't Hooft *modus operandi* for 'discussion' – invoke a right to silence. I invited you twice to tell us all what bound there is on asymptotic, as a starting point for discussion of a simple inconsistency in black hole 'theory'. Now you finally answer that invitation with "*The decreasing exponentials do not stop approaching zero*." Excellent! This is a general characteristic of asymptotic – that which is asymptotic, for otherwise it would not be asymptotic.

(2) 't Hooft, you are a proponent of black holes, big bang creationism, Einstein gravitational waves, etc. The big bang creationism asserts that there is a Cosmic Microwave Background (CMB) remnant of the BANG! Yet you have remained silent (of course) on its non-existence. I therefore reiterate: All proponents of big bang creationism claim that some big bang just created the Universe and produced a Cosmic Microwave Background that is present as an isotropic remnant at 2.725 K blackbody. They claim that they have measured the temperature of the Universe and anisotropies in it. However, none of it is true:

Professor Pierre-Marie Robitaille: The Cosmic Microwave Background https://www.youtube.com/watch?v=i8ijbu3bSql

That all big bangers allege the presence and measurement of their CMB and associated anisotropies does not make the CMB real. Just as the so-called CMB is a demonstrable falsehood, so too are the black holes, the big bangs, the Einstein gravitational waves, etc., notwithstanding majority rule.

(3) 't Hooft said: "I should have stopped discussing with this person long ago."

Of course; that's because you never really discuss anything, only tell people that they are 'bad physicists' because they don't agree with the demonstrable nonsense that is now so often called 'physics' and which you favour.

Gerard t Hooft + al 33.92 + a 240.59 + Universiteit Utrecht

Crother's arguments about black holes and gravitational radiation are to be summarised as follows: "I don't understand these phenomena and the calculations, therefore the phenomena do not exist and the calculations are wrong." He must have been inspired by Mr. Robitaille, whose lecture he refers to. This lecturer explains that he does not understand how the cosmic background radiation is measured, therefore the measurement must be wrong. Crothers deduces: therefore it the CMB does not exist, and therefore there was no big bang, which he didn't believe in anyway. I explained how grav. radiation can be calculated, that it turns out to go with the speed of light, and I explained that the black hole is an asymptotic solution for imploding matter, but Crothers repeats that I did not answer his questions. I must conclude that he uses the same reasoning: I don't understand it, so the questions were not answered, so it must be wrong.

I won't explain how the CMB is measured (using all these different frequencies to eliminate background - or foreground - effects), as I am not an experimental physicist. I know that these are smart people who can explain perfectly well all details of their set-up.

Stephen Crothers • III 13.05 • III 5.52 • Alpha Institute of Advanced Study

(1) 't Hooft said: "Crother's arguments about black holes and gravitational radiation are to be summarised as follows: "I don't understand these phenomena and the calculations, therefore the phenomena do not exist and the calculations are wrong."

't Hooft, you've really got yourself to the very bottom of your barrel now with your fibs about the course of events and 'explanations'. I only ever invited you to explain two things: (1) a first-order intrinsic differential invariant, (2) what bound there is on asymptotic. After repeated evasion you finally admitted that you don't know what (1) is, and that there is no bound on asymptotic, for otherwise it would not be asymptotic. You don't even understand (1), by your own admission, yet jibe that it is I who does not understand.

As I have said before several times, what you say I say and what I actually say are two very different things. And although I invited you repeatedly to cite what I said by which you allege I said what you said I said, you never did; because I never did. It is a 't Hooft *modus operandi* to invent things and then falsely attribute your inventions to others.

(2) 't Hooft said: "I explained how grav. radiation can be calculated, that it turns out to go with the speed of light, and I explained that the black hole is an asymptotic solution for imploding matter, but Crothers repeats that I did not answer his questions. I must conclude that he uses the same reasoning: I don't understand it, so the questions were not answered, so

it must be wrong."

Your admission 't Hooft on the general nature of asymptotic process amounts to a sufficient admission to the invalidity of 'black hole theory'. Without asymptotic process there is no 'black hole theory', since the latter is partly but necessarily defined by the former. No calculations are needed to understand why the asymptotic process itself actually invalidates 'black hole theory'. I have explained this in detail elsewhere, several times.

Since General Relativity violates the usual conservation of energy and momentum for a closed system it is in conflict with a vast array of experiments. This also necessarily affects Einstein's alleged gravitational waves, since they are energetic. The violation of the usual conservation laws itself rules out Einstein's alleged gravitational waves, and much more besides. I have explained this in detail elsewhere too, several times.

(3) t' Hooft said: "He must have been inspired by Mr. Robitaille, whose lecture he refers to. This lecturer explains that he does not understand how the cosmic background radiation is measured, therefore the measurement must be wrong. Crothers deduces: therefore it the CMB does not exist, and therefore there was no big bang, which he didn't believe in anyway."

Now you mock and vilify Professor Robitaille, simply because you don't like what he reports. And just how did you come to the conclusion 't Hooft that Robitaille doesn't know "how the cosmic background radiation is measured"? You have not provided any evidence for this charge either. It's another 't Hooft Almighty command. No, Professor Robitaille is a leading expert in imaging science. He knows very well how the alleged CMB has been allegedly 'measured'. I refer all readers to the following,

as a starting point, subsequent to Professor Robitaille's conference video, already cited and linked above:

Robitaille P.-M. WMAP: A Radiological Analysis http://www.ptep-online.com/index_files/2007/PP-08-01.PDF

Robitaille P.-M. COBE: A Radiological Analysis http://www.ptep-online.com/index_files/2009/PP-19-03.PDF

There is no CMB; there is no Big Bang.

(4) 't Hooft said: "I won't explain how the CMB is measured (using all these different frequencies to eliminate background - or foreground - effects), as I am not an experimental physicist. I know that these are smart people who can explain perfectly well all details of their set-up."

Although you admit 't Hooft that you, not being an experimental physicist, don't know about imaging science, microwave instrumentation, and experimental physics, that did not stop you from vilifying Professor Robitaille on experimental physics. Ah, but of course, it's due to the 't Hooft method of Almighty command. How silly of us. We should have remembered the 't Hooft *modus operandi*.

Gerard t Hooft + # 33.92 + # 240.59 + Universiteit Utrecht

Let me explain to those others who may still be following this blog (presumably none): gravitational waves do exactly the same thing as the electromagnetic waves that you use in your mobile telephone: they transmit energy from one place to somewhere else. Now if something is true it can be proven in many ways. I can't do it by using Crothers' "first order intrinsic differential invariant", which I don't understand since, according to C., it does not exist. Instead, the existence of a Hamiltonian suffices, but it is also interesting that one can show this by constructing a local, effective stress-energy momentum tensor T_munu for gravitational waves. If anyone is interested (which I doubt) I can show in rough lines how I construct that (It's actually rather trivial).



(1) I note 't Hooft that you ignored, as usual, the issues I listed in my previous post. I therefore refer you back to that post. Provide your evidence for your allegation that Professor Robitaille "does not understand how the cosmic background radiation is measured".

There is no CMB and so nobody can measure it, let alone find anisotropies in it. I refer you again 't Hooft, and all readers here, to my previous post wherein I provided links to two of Professor Robitaille's papers on the subject.

(2) 't Hooft said: "I can't do it by using Crothers' "first order intrinsic differential invariant", which I don't understand since, according to C., it does not exist."

That has been my point all along 't Hooft - such invariants do not exist; yet Einstein and his followers implicitly 'construct' them and proceed to use them to represent physical entity, model physical phenomena, and to do 'calculations'. The implicit construction of first-order intrinsic differential invariants has no valid basis in pure mathematics, and so they can't be used for calculations or to model anything. Thus, the 'construction' which spawns them is nothing but meaningless concoction of mathematical symbols. Those who employ such 'constructions' do so in violation of pure mathematics itself.

Gerard t Hooft + # 33.92 + # 240.59 + Universiteit Utrecht

OK, Einstein "and his followers" made meaningless concoctions but there's no reason to doubt the opinion of Professor who? Robitaille ...

Stephen Crothers $\cdot \parallel 13.05 \cdot \parallel 5.52 \cdot \text{Alpha Institute of Advanced}$ Study

(1) t' Hooft said: "OK, Einstein "and his followers" made meaningless concoctions but there's no reason to doubt the opinion of Professor who? Robitaille ..."

And your scientific argument is precisely what? I suggest that you actually and carefully study Professor Robitaille's papers before you shoot your mouth off any further and thereby dig a deeper hole for yourself, black or otherwise.

(2) Einstein and his followers have indeed implicitly 'constructed' first-order intrinsic differential invariants and so they are all talking nonsense. But like you 't Hooft, they don't know what a first-order intrinsic differential invariant is. But the pure mathematicians, not I, proved a very long time ago that such invariants do not exist.

S

Stephen Crothers - III 13.05 - III 5.52 - Alpha Institute of Advanced Study

't Hooft said: "When a mathematician proves something to you, check what his assumptions were."

Too bad you don't practice what you preach 't Hooft. The assumptions at the base of black holes and big bangs and General Relativity are demonstrably false. One can't have matter present and absent by the very same mathematical constraint. This is sufficient to ruin General Relativity. One can't have an escape velocity and no escape velocity simultaneously at the same place. This is sufficient to ruin 'black hole theory'. There are no such things as objects possessing infinite density, infinite gravity, infinite pressure, and infinite hotness. Points and circumferences of circles are incapable of possessing such physical properties, let alone 'infinities' thereof, since they are only mathematical entities (and singularities too are mathematical things, not physical things). And the Principle of Superposition is invalid in General Relativity owing to its nonlinear form. These also ruin big bang creationism and 'black hole theory'.

The Universe did not spring into existence from nothing by means of some big bang creationism. Such notions are mysticism masquerading as science, no matter how much they are dressed up with complicated sums. Big bang creationism is creationism, not physics, not even metaphysics. There are no such things as black holes or wormholes or white holes either. They too are figments of irrational imagination. They are not even consistent with the 'theories' that allegedly predict them! Science cannot permit such nonsense to continue any longer with impunity.



Gerard t Hooft · # 33.92 · 1 240.59 · Universiteit Utrecht

Like me, Einstein only used concepts he understood. I don't need concepts that don't exist to prove that what I don't do is wrong.

Don't let "pure mathematicians" prove something to you that you don't understand, as what happened to poor Mr. Crothers. I never leave anything to be done by pure mathematicians. One should only accept mathematical proofs that one can understand and reproduce oneself at any moment. Crothers thought that the velocity of gravity waves would become arbitrary. This makes me suspect that his mathematicians did not consider the background metric. Then indeed you get contradictions. When a mathematician proves something to you, check what his assumptions were.

Gerard t Hooft + # 33.92 + # 240.59 + Universiteit Utrecht

@Yurij, @Demetris, @Crothers, @Michael, you all have your own reasons to think that there are flaws in GR, and its predictions concerning black holes, gravitational waves and the big bang. This became the main theme of this discussion site. I did my best to explain why all these apparent flaws are illusions due to bad understanding. I've hardly seen a serious discussion of the alternatives that you have in mind. The series of flaws in these alternatives is endless, but I leave them for yourselves to discuss. Maybe some of my arguments were inaccurate, maybe I made mistakes, but please now look at the 'steady state models' of your friends here and have a good laugh at those. I quit.

Gerard t Hooft + # 35.15 + # 240.59 + Universiteit Utrecht

@Demetris: GR not a long distance theory? Then Maxwell's theory of the electro-magnetic forces is also not a long distance theory ... since it's just like GR.

Maxwell's theory has electric charges and currents as its source terms. Does that mean that outside all these charges and currents all electric and magnetic fields vanish? Of course not. Dear Demetris, there are partial differential equations to be solved.

Your problem is a non-problem. Just like electric charges influencing each other at a distance, so do gravitating masses. The only conceptual difference between GR and Maxwell is that GR's equations are non-linear When masses are small the non-linear corrections are negligible.

No failure at all in GR.

@Crothers: too bad that you have absolutely no understanding of what black holes are. Matter present and absent at the same time? Singularities that ruin black hole theory? Objects possessing infinite density etc.? Wow, I thought previously that you were only a little bit confused! Previously I thought that we had stumbled upon the agreement that the black hole configuration is only reached asymptotically at time = infinity, and even at that point, an observer cannot see the singularity. So the black hole singularity is much like the singularities of mathematical functions in the complex plane while physics is on the real axis. You still didn't realise this? Ever heard of "cosmic censorship"? All known singularities of black holes are hidden behind horizons and as such could be called unphysical. It's the horizon (an asymptotically defined concept) that characterises a black hole; the singularity is physically immaterial. The horizon is a property of the stationary situation that large amounts of masses reach (asymptotically, but fast) when their gravitational attraction passes a certain limit. Ever tried to compute what else they could end up in? Suppose I take matter with equation of state p=0 in its rest frame (matter called "dust" in professional jargon) and let it attract itself. The calculation is easy in the spherically symmetric case, but you can take non-spherical configurations if you are a bit more clever (which I now doubt). This stuff can go through its horizon when the density is still low, so nowhere do you need the physical requirement that p>0. Ordinary sand, deleted to pressure less than one g/cm³, can be used as example. You only need much of it (take 1 galaxy by weight ...)

Big Bang is creationism? What would you like to put in its place? That the age of the universe is infinite? I thought you didn't like infinities. Please don't come with that theory of photons getting tired. I prefer creationism if you say a thing like that.

Time for me to quit this blog as well.

Stephen Crothers - III 12.92 - III 5.52 - Alpha Institute of Advanced Study

"t Hooft said: "@Crothers: too bad that you have absolutely no understanding of what black holes are. Matter present and absent at the same time? Singularities that ruin black hole theory? Objects possessing infinite density etc.? Wow, I thought previously that you were only a little bit confused!"

Ah, once again the reliable 't Hooft *modus operandi* – tell all and sundry that they don't understand, make things up and attribute your conjures to your opponents. And thanks 't Hooft for amplifying further the black hole nonsense and reaffirming your commitment to such demonstrable rubbish. Your comments alone on the asymptotic process that in part defines the black hole fantasy reveal that you can't, as I said before, even see the simplest of contradictions in this codswallop.

I reiterate that what I actually say and what you say I say are two different things. Go back and check what I said 't Hooft. For instance, I actually said that according to GR matter is both present and absent by the very same mathematical constraint. Now that's a pretty simple contradiction, but, as I said before, you can't even see it. That contradiction alone ruins GR.

Big bang is indeed creationist claptrap – by it the Universe created itself from nothing! Hey presto! That's even better than a magician pulling a rabbit from a hat.

And your own online lectures on GR and black holes attest to all the standard nonsensical attributes of black holes and big bangs. So I will soon quote you directly, in full context, and with appropriate 'ornaments'.

Whether or not you leave this forum doesn't matter. You are not important. Only the facts and logic are needed by science.

Ilja Schmelzer - II 12.24 - II 6.77 - Independent Researcher

Gerard, while I'm on your side in this discussion (not visible because I no longer bother to answer if Crothers writes nonsense) I disagree with you about the importance of cosmic censorship. Hidden behind horizons does not mean unphysical - if GR is true, one can reach them anyway by falling into it. A suicidal experiment for humans, of course, but suicides are also parts of physics. And, anyway, GR predicts what really exists and if it predicts singularities, this is a strong hint that it is wrong, independent of the question if we can see them or not.

That's the point of singularities - we can be quite sure about this even without actual observations. In this sense, singularities are similar (even if far less strong) to internal logical contradictions: One does not need observations to reject theories which have them.

So, protecting the singularities from observation does not help. GR can be, at best, an approximation.

Gerard t Hooft + # 35.15 + # 240.59 + Universiteit Utrecht

@IIJa: OK, we mostly do agree, also about better not responding to Crothers. You are right that a suicidal observer would encounter the singularity, and at that point GR breaks down, but it is a bit a question of semantics whether that should be referred to as real physics, since observers outside notice nothing. The black hole may or may not evaporate by emitting Hawking radiation and not receiving further food. If it evaporates, the question is what "really" happens to that suicidal observer. Things become ambiguous. I have a candidate answer to that: black hole complementarity. Also you have to realise that the singularity is not stable: with a tiny amount of angular momentum, it changes into a ring around the equator (Kerr-Newman case) and the observer can travel through the loop, only to discover further troubles like closed timelike curves - all of this totally imperceptible for those who stay outside. As for the breakdown of GR at the singularity, this IS a quantum problem, QM changes everything in the singularity.

Gerard t Hooft + al 35.15 + to 240.59 + Universiteit Utrecht

Rockets loaded with nonsense are fired at me from many directions in this blog. @Demetris: I explained to you that your problem does not exist, have you never tried to solve a differential equation? @Ilja, do you really want to give up equivalence of gravitational and inertial mass? And not to speak of @Crothers, who clearly never had the foggiest notion of the space-time structure of what is known as a black hole. Good bye friends.

Stephen Crothers • II 12.92 • II 5.52 • Alpha Institute of Advanced Study

Schmelzer said: "Gerard, while I'm on your side in this discussion (not visible because I no longer bother to answer if Crothers writes nonsense)"

And what nonsense is that Schmelzer – that Big Bang creationism is mystic creation from nothing? That according to proponents of GR material sources are both present and absent by the very same mathematical constraint? That infinite gravity, infinite pressure, infinite density, and infinite hotness are not in fact possessed by any objects? That singularities are not objects? That the Principle of Superposition is invalid in GR?

No, it is not I talking nonsense. You are up there with 't Hooft and his mystic Big Bang creationism, his reified singularities, and his magical infinities.

Stephen Crothers · **i** 12.92 · **i** 5.52 · Alpha Institute of Advanced Study

"t Hooft said: "@*Ilja: OK, we mostly do agree, also about better not responding to Crothers.*"

So now you have decided to bail out 't Hooft? No matter, there is more to come concerning your Big Bang creationism, your magical black holes, and your mythical Einstein gravitational waves. Silence you might find golden, but it is not science.

"t Hooft said: "Rockets loaded with nonsense are fired at me from many directions in this blog."

And what nonsense is that 't Hooft – that Big Bang creationism is mystic creation from nothing? That according to proponents of GR material sources are both present and absent by the very same mathematical constraint? That infinite gravity, infinite pressure, infinite density, and infinite hotness are not in fact possessed by any objects? That singularities are not objects? That the Principle of Superposition is invalid in GR? That there is no solution to Einstein's field equations for the gravitational interaction of two masses, m1 and m2, or even an existence theorem for two or more masses?

No, your claims, though standard, are all demonstrable nonsense.

"t Hooft said: "Crothers, who never had the foggiest notion of the space-time structure of what is known as a black hole."

Really! Those things you claim have a "physical" or "curvature" singularity inside them? Those things that are in major part defined by asymptotic process? Those things that have an event horizon? Those things that allegedly have infinitely dense singularities? Those things conjured up by the very same who conjure up Big Bang creationism, but pretend their brand of creationism is 'science'?

No 't Hooft; the black hole is in the same boat as Big Bang creationism – it too is the product of irrational imagination.

 \mathbf{T}



Follow

Question

Do you agree with Stephen Hawking's recent conclusion that black holes don't exist?

Black holes don't exist. I published this many years ago. Cantor's Universe doesn't allow the concept.

Stephen Hawking now came up with the same conclusion. Read: http://www.spektrum.de/news/es-gibt-keine-schwarzen-loecher/1222059

In my opinion he is right this time. What is your opinion? Was he right then or is he correct now?

https://www.researchgate.net/post/Do_you_agree_with_Stephen_Hawkings_recent_c onclusion_that_black_holes_dont_exist?cp=re68_x_p2&ch=reg&loginT=XQbu87dm 9Mtz04pcvOyPaBrz2NKF8GTvyF1gmjg6dT4*&pli=1#view=53c2b5aad5a3f25e218 b45ed

No, I do not agree with this statement by Hawking; it is highly misleading. Only in an abstract mathematical sense you can say that the horizon is not infinitely sharply defined, but if you realise that every microsecond (but this time unit is different for black holes with different masses) one decimal place is added to the exact definition of the location of a horizon, and if you realise that black holes have lifetimes of countless of millions of years, you might agree with me that this inaccuracy in the horizon's definition is only a formal one; physically it is irrelevant. I can make this statement even more precise: black holes are the infinite

mass limit of a class of objects that play a very important role in physics. When the mass is in the milligram regime, these objects are not yet extremely close to this "infinite mass" case, so they are only approximately distinguishable from ordinary physical particles. But when the mass is that of several solar masses or more, such as all astronomically observable black holes, they are so close to the infinite mass solution that no physics experiment ever will be able to detect any blurriness.

When you say that it takes an infinite time to form a black hole, you are only formally correct, but in practice it takes milliseconds or less to make something that's indistinguishable from a black hole.

@Michael, no you are mistaken, gravitational waves are completely legal, physical solutions of Einstein's equations, which have been tested experimentally in many ways. In particular the Hulse Taylor pulsars contradict you.

I won't mingle in the metaphysical discussions ...

Stephen Crothers $\cdot \parallel 13.05 \cdot \parallel 5.52 \cdot \text{Alpha Institute of Advanced}$ Study

't Hooft said: "@Michael, no you are mistaken, gravitational waves are completely legal, physical solutions of Einstein's equations, which have been tested experimentally in many ways. In particular the Hulse Taylor pulsars contradict you."

No, it doesn't. Einstein's alleged gravitational waves are not "*completely legal*" at all. In fact, they are a phantasm. That's precisely why they have not been detected and never will be detected.

As for Mr. 't Hooft's comments on black holes, the only thing he said or implied that is right is that Hawking's latest incantations do not eliminate his black holes. Hawking clings to them in any event.

@Robin: formally you are right, but it has nothing to do with the finite lifetime of the universe: travelling through the horizon takes an infinite amount of time, when seen from a distance, so an inhabitant of our universe can never have seen something or someone go through the horizon if the black hole has been formed at any moment in our past history. You can always choose coordinates such that the *singularity* of the black hole lies beyond the infinite future of the outside world, because the horizon sits in between. Indeed, you can say that in our world, the black hole singularity does not exist. Now, someone going into a black hole won't agree with this, (s)he lives on to approach the singularity, and will be killed by it. This is because time dilation will also be infinite.

Now, a black hole is defined by the existence of such a situation with a horizon; the outside world can't change that anymore, everything you throw in arrives too late. This is what makes the black hole real, not its singularity.

Only complication in this picture is quantum mechanics; it says that a black hole can decay. This leads to a paradox that causes Hawking to make his strange claims. We have to face the possibility that there must exist different, complementary ways to formulate what happens inside and near a black hole.

Angular momentum does not change this situation, except in the "extreme" case; when angular momentum is maximal, the horizon retreats inside an infinite corridor, but it's still there. In the case of angular momentum, you can travel past the singularity, which now only sits on the equator. Past that, spacetime is weird, it has closed timelike curves, but that situation is unstable.

With "torodial structure" you probably mean the ergosphere, where particles can harvest energy out of the Kerr-Newman black hole. Still, all this makes astronomical black holes indistinguishable from the stationary solution.

Don't believe Mr. Crothers, he has been confused about this for years. Simply mistaken. What he might mean is that gravitational plane waves, repeating themselves literally over infinite space-time, can't exist. Sure they can't because that would represent an infinite amount of energy, which would collapse, I'm sorry to say, into a black hole. We don't have such ideal waves in our universe. But we have superpositions in the form of wave packets, only representing finite amounts of energy. The Hulse Taylor pulsars also emit only a finite amount of gravitational wave energy, so that their orbits lose energy and they collapse. The waves stop after that. So physical gravitational waves exist, mathematical plane grav waves don't.

Gerard t Hooft + # 33.92 + # 239.47 + Universiteit Utrecht

@Gorgels: very interesting. I do believe that the ultimate answer to our questions will take a pure mathematical form. However, one first must pose the physical question, and formulate the numerous constraints imposed by physics. Otherwise you can't make any contact with the real world. What we do want to understand is how a compact, efficient description can be given of a world where we have general relativity, quantum mechanics, and the quantum field theory of elementary particles (at energies below 1TeV it must yield the Standard Model, and possibly some dark matter in addition)

Stephen Crothers • al 13.05 • a 5.52 • Alpha Institute of Advanced Study

Mr. 't Hooft said: "Don't believe Mr. Crothers, he has been confused about this for years."

Mr. 't Hooft routinely tries to tell people what to do. This is his modus operandi, but it is not a scientific method. Some years ago he even told the then Editor of Physical Review D, Eric Weinberg, actually he warned him, in writing, not to publish any paper submitted to *Phys. Rev. D*. by one Dr. Chung Lo in the USA.

(2) Mr. 'Hooft said: "What he might mean is that gravitational plane waves, repeating themselves literally over infinite space-time, can't exist. Sure they can't because that would represent an infinite amount of energy, which would collapse, I'm sorry to say, into a black hole."

What I mean and what Mr. 't Hooft says I might mean are two different things.

The speed of propagation of Einstein's alleged gravitational waves is coordinate dependent. And one can change coordinates with the "speed of thought".

First-order intrinsic differential invariants do not exist.

Thus, Mr. 't Hooft's claim that Einstein gravitational waves "are completely legal" is in fact completely false.

(3) Mr. 't Hooft is an ardent proponent of black holes, and so he sees them all over the place, just as those who believe in ghosts see them all over the place, despite the fact that black holes are 'theoretical' phantasms and the fact that nobody has ever found a black hole, despite the claims for billions of them all over the Universe.

I'm sorry to see that Mr. @Crothers is having some trouble with coordinate transformations. I'm not going to show him here how to do the calculation right, there are numerous advanced text books where he can find how to do it.

@Michael, I strongly disagree with you. If a prediction of 1 event is not corroborated by experiment, that means precisely nothing. In my field of science, predictions come with statements on the expected margin of error; if you predict N events, usually your expected error is greater than Sqrt(N): besides the statistical error one has the systematic uncertainties of the assumptions and the calculation. If the probability curve is a Gaussian, then you can calculate the significance of an agreement or disagreement with observation in terms of a guantity usually called sigma, roughly the deviation divided by the width of the Gaussian. If this sigma is less than 6, experience tells us that still anything can happen. If it is greater than 6 you have a discovery or a refutation. So you need to predict dozens of events before a null observation may give reasons for concern. Even in that case, one can easily imagine that many other assumptions that went into the prediction could be put in doubt, before you start to wonder about gravitational waves themselves. Have they been too optimistic concerning the abundance of sources, events sufficiently violent to produce detectable signals? Have the signals been calculated correctly, and so on.

Of course good scientists will also question the theory of gravitational waves, but then they also have to come with an acceptable explanation as to why the double pulsars agree with theory so well: they sure seem to dissipate their orbital energy, exactly in accordance with the GR calculation of the intensity of the grav waves they emit.

@Michael: referring to your entry of 4 days ago, I'm afraid you are making an assumption that seems natural but it is erroneous, by asserting that the atomic nature of matter causes its gravity to take a form that differs significantly form the gravity of strictly continuous and smooth sources with the same average mass distribution. Just look at planet earth: is its gravitational field affected by the fact that earth is made out of atoms? Not a bit.

Point is that one can do the following calculation: Take matter in the form of "dust", which in GR stands for a source with, in its local rest frame, energy density rho and pressure zero. So it's continuous. One can solve exactly the case when dust attracts itself gravitationally, in the spherically symmetric case. A black hole forms, and most importantly, while the dust passes through the horizon it created itself, the local density is still low, so no reason to replace its equation of state there. The singularity comes much later, so there, one can't maintain that the pressure stays zero, from a physical point of view. But there it's too late, it doesn't matter what you assume the source will do, the black hole is already there. Next, calculate how this solution gets modified if you assume any kind of fine structure, like graininess of the dust material. All such effects are short range and without any major effect, just like what we have for planet earth. Again, what happens beyond the horizon is totally immaterial, the effects can't spread faster than the local speed of light, which will never reach the outside world. So, the outside world can only see that there's a horizon.

Also, you can consider deviations from spherical symmetry, and observe that the black hole scenario is extremely robust. Only if you add so much angular momentum that L exceeds the extremality limit of the Kerr (or Kerr-Newman) solution, you can stop the collapse from happening, or if you add enough pressure to the dust, like what happens when a star collapses to make a white dwarf rather than a black hole.

@Michael, you say that black holes cannot be formed in a finite amount of time, but that depends on when you start calling something a black hole. The thing that forms evolves into its final state with deviations that shrink exponentially in time (as seen by any outside observer). After milliseconds there have already been so many e-folds that it's not practical to still expect it to turn around to form anything else than a black hole, which, admittedly, only defines the final state with all exponentially small deviations ignored.

I'm a sober-minded physicist who thinks he's able to make good approximations if needed. Approximating the gravitational effects of a cloud of particles can be done by pretending it to be continuous for starters; then worry about the fact that you have individual particles, all being point sources. Look at planet earth: what difference does it make? Every atom is surrounded by its gravitational field. Does that affect earth's gravity as a whole? Of course not. The situation with black hole formation is not different. Where the cloud forms a horizon the particles still obey perfectly normal physical equations. Only far beyond that, at regions of space-time where nothing matters anymore, you encounter the singularity. For the outside observer, that's far beyond time=infinity, therefore, the singularity is totally irrelevant for the discussion whether black holes exist.

But I plan to terminate my participation in these discussions ...



Stephen Crothers - # 13.05 - # 5.52 - Alpha Institute of Advanced Study

Mr. 't Hooft said: "I'm sorry to see that Mr. @Crothers is having some trouble with coordinate transformations. I'm not going to show him here how to do the calculation right, there are numerous advanced text books where he can find how to do it."

As I said before, what I say and what Mr. 't Hooft says he thinks I say are two very different things.

First, it is a fact that the speed of propagation of Einstein's alleged gravitational waves is coordinate dependent - Einstein and his followers invoke a set of coordinates to get the arbitrarily predetermined speed of propagation at c. Since one can change coordinates with "the speed of thought" there is no unique speed of propagation, contrary to the claims of the Einstein gravitational wavers. The textbooks Mr. 'Hoofts resorts to do not change this fact. The textbooks merely regurgitate Einstein and one another.

Second, since first-order intrinsic differential invariants do not exist, Einstein's alleged gravitational waves simply do not exist, because Einstein and his followers unwittingly invoke a first-order intrinsic differential invariant for the theory of his 'waves', and so his theory of gravitational waves is demonstrable nonsense.

Perhaps Mr. 'Hooft could provide us all here with his 'proof' that first-order intrinsic differential invariants exist. Indeed, I invite Mr. 't Hooft to present us with his attempted proof for our examination.

Everything Mr. 't Hooft has said about black holes is demonstrable nonsense, except that Hawking's latest incantations do not eliminate his black holes. Hawking still clings to all his black holes (inside some unspecified big bang creation universe).

Mr. 't Hooft said: "But I plan to terminate my participation in these discussions ..."

Of course, this is expected, because Mr. 't Hooft can't tell everybody here what to do, despite Eric Weinberg of Phys. Rev. D obeying his Almighty commands, and he can't prove the existence of first-order intrinsic differential invariants (since they don't exist!).



Yurij V. Baryshev All 35.66 · **B** 88.7 · Saint Petersburg State University Dear Gerard t-Hooft.

I have to make a comment on your note about the gravitational waves in GR:

"The Hulse Taylor pulsars also emit only a finite amount of gravitational wave energy, so that their orbits lose energy and they collapse. The waves stop after that. So physical gravitational waves exist, mathematical plane grav waves don't."

If you are specialist in general relativity you must know that in the geometrical gravity theory momentum of gravitational field.

By the way the concept of black hole also is consequence of the absence of the energy-momentum for the gravitational field in GR. The situation is the same as in the definition of the classical electro radius, energy in the gravitational field becomes equal to Mc² for a gravitating body at gravitational radius R_g:

(see http://arxiv.org/abs/0809.2323 and http://arxiv.org/abs/0809.2328).

This is why Feynman in his "Lectures on Gravitation" insists on developing the Field approach to gravitation theory where the energy of gravitational field is the physical basis of the theory. He emphasized that: "The geometric interpretation is not really necessary or essential to physics".

So physical gravitational waves exist and carry energy-momentum of gravitational field, but it is not consistent with the basis of general relativity.

Gerard t Hooft · # 33.92 · 1 240.59 · Universiteit Utrecht

@Yurij. Your sentence "If you are specialist ..." does not end in a statement what you think I must know.

Energy and momentum of grav. field *do* exist, but only in reference to a "background metric". So first you must describe a spacetime metric $g_{mu}^{0}_{nu}$, without black hole, grav. waves or whatever, so usually that's just flat Minkowski space-time, which serves as a "background". Then you replace in some region in that spacetime the metric by what you want, black hole, grav. ripples or whatever (be careful, the black hole is not fool-proof). So now the metric is $g_{mu \ nu} = g_{mu \ nu}^{0} + g_{mu \ nu}^{1}$. Then, you can define a $T_{mu \ nu}$ for the g^{1} field only, and that's straightforward (just consider infinitesimal variations for g^{0}). Now this was not understood the early years, and still now people get confused. See the confused statements by Crothers.

Note that a flat background is more difficult to use in cosmology, so the total energy of the cosmos is more difficult to define. So be it. Physical gravitational waves exist and are totally consistent with the basis of general relativity. Feynman was very smart but didn't care much about formal mathematics. So he just ignored what mathematicians say; it would be typical for him to say "who cares about the basis of general relativity. I have a theory here that works, that's what I care about. But I, like a very large number of others, see that it all fits perfectly well. No need to throw either GR or grav. waves or big bang theory overboard.

Gerard t Hooft + # 33.92 + # 240.59 + Universiteit Utrecht

@Yurij. The abstracts of your papers are very strange. Isn't it obvious that the energy density of an ordinary, standard gravitational field like the one surrounding our planet is negative? How else can you understand that energy is gained when masses come together to make even stronger fields?

Since like masses attract while like electric and like magnetic charges repel, this sign difference when compared to electromagnetism is inevitable.

It so happens that large masses are needed to generate gravitational fields, and masses carry *positive* energy, which is why the total energy of gravitating systems is still positive, but, as you said somewhere, this situation is not stable, which is why black holes can form. Note that the total mass-energy of black holes is still positive, and I have seen more general proofs that gravitating systems in GR in general carry total energy which is positive.

Yurij V. Baryshev - #35.66 - #88.7 - Saint Petersburg State University

Dear Gerard, thanks for your good answer. It explains your position very well.

Sorry for incomplete text in my preceding letter due to error in copy command. The actual sentence is following:

"If you are specialist in general relativity you must know that in the geometrical gravity theory (which is GR) there is no energy density of gravitational field - see L.D.Landau & E.M.Lifshitz, "The Classical Theory of Fields", Oxford, 1971 (par. 101, "The energy-momentum pseudotensor"). Hence strictly speaking in GR there is no physical gravitational waves which carry energy-momentum of the gravitational field, contrary to the case of EM waves."

This is well known problem which is reviewed in modern literature and contained hundreds papers. Equivalence principle forbids the localization of the gravitational field energy. However modern quantum gravity theories predict violation of EP at some level.

As it is well-known, in relativistic quantum field theory the energymomentum of any fundamental physical field is the TENSOR of the Minkowski space and it is localizable with positive energy density (T_00 > 0 for integer spin). Electromagnetic waves carry energy density which can be localized and transfer to a detector. According to Noether theorem the Minkowski space is the cause of the conserved energymomentum tensor of any fundamental physical field, but This is not the case in GR, where only "pseudoTENSOR" of gravity field exists.

Minkowskian background, again) so that products of first order derivatives arise in stead of second derivatives, but I am not sure whether the same result comes out; I suspect it does. Note: here, one could start with T $_{mu nu matter+grav} = -G _{mu nu} + T _{mu nu} _{matter}$. That's zero, so certainly conserved, but partial integrations of G turn it into something not zero, but obviously still conserved. Crothers' (b) and (c) are repetitions of what he said earlier, and are to be ignored. Robitaille is one ill-informed opinion against hundreds of others. As for (d), Crothers never explained what he means, but I presume it's just the basic observation that true Riemann tensors of the type he wants cannot exist. All I need is s pseudotensor. This is essential and important. You need a background Minkowski space for the definition of energy. I understand that mathematicians don't want to add a g^0 and a g^1 . That's their problem. It's the only way o understand how things work.

$\underline{\textbf{Stephen Crothers}} \cdot \parallel 13.05 \cdot \blacksquare 5.52 \cdot Alpha Institute of Advanced Study$

(1) 'Hooft said: "Energy and momentum of grav. field do exist, but only in reference to a "background metric". So first you must describe a spacetime metric g0mu nu, without black hole, grav. waves or whatever, so usually that's just flat Minkowski space-time, which serves as a "background". Then you replace in some region in that spacetime the metric by what you want, black hole, grav. ripples or whatever (be careful, the black hole is not fool-proof). So now the metric is gmu nu = g0mu nu + g1mu nu . Then, you can define a Tmu nu for the g1 field only, and that's straightforward (just consider infinitesimal variations for g0). Now this was not understood the early years, and still now people get confused. See the confused statements by Crothers."

No, I'm not confused 't Hooft. That's your malicious imagination at work again. The black hole universes are all defined in part by an asymptotic process and this leads to an insurmountable contradiction – black hole spacetimes, in the hands of the cosmologists, become asymptotically something and not asymptotically anything simultaneously. Marvellous!

(2) 't Hooft said: "No need to throw either GR or grav. waves or big bang theory overboard."

(a) This is not true 't Hooft. Although there is a 'conservation law' in General Relativity, it however violates the usual conservation of energy and momentum for a closed system and so General Relativity is in conflict with a vast array of experiments. That is sufficient to end General Relativity. And there are additional contradictions in General Relativity that of themselves invalidate it.

(b) Owing to (a) alone, Einstein's gravitational waves do not exist.

 \mathbf{T}

(c) Big Bang creationism is also ruled out by (a) alone. Moreover, the Big Bang creationism, and it is nothing but creationism masquerading as science, alleges an isotropic Cosmic Microwave Background (CMB) present as a remnant at 2.725 K blackbody. However, there is no CMB, and so, contrary to reports, it has not been measured and there are no anisotropies in it. You continue to ignore the facts 't Hooft, so here they are again:

Robitaille P.-M. WMAP: A Radiological Analysis http://www.ptep-online.com/index_files/2007/PP-08-01.PDF

Robitaille P.-M. COBE: A Radiological Analysis http://www.ptep-online.com/index_files/2009/PP-19-03.PDF

(d) General Relativity implicitly invokes first-order intrinsic differential invariants. However, the pure mathematicians proved very long ago that first-order intrinsic differential invariants **do not exist!** Consequently, General Relativity violates the usual conservation of energy and momentum for a closed system. This is the very basis for (a). You have already admitted 't Hooft that you don't even know what a first order intrinsic differential invariant is.

@Yurij. I know, and certainly agree, that the stress-energy-momentumtensor I have been talking about all the time is a pseudotensor, in the sense that it does not transform as a true tensor under general coordinate transformations. If I ever gave the impression that it should transform as a true tensor then I have to correct that. It does not. But then you say that, because of that, energy and momentum for gravitational waves are not conserved. Crothers thinks the same thing in his answer (a). Here I do not agree. The point is that you actually don't want a real tensor for that. A real tensor would, at best, obey a continuity equation with covariant derivatives, so that the integral of its 00 component would not be conserved. If I use Minkowski as background (the only important case) then the pseudotensor I talk about obeys a continuity equation, d_{mu} T_{mu nu} = 0 (when matter is added) with *ordinary* partial derivatives. So its 00 component integrates to become an exactly conserved energy.

There's an other reason why true Riemann tensors cannot be used: a local gravitational field should carry a large amount of (negative) energy density, yet under an accelerated coordinate transformation it can locally be transformed into a situation where the field vanishes, so its T $_{mu nu}$ should vanish. That's a contradiction, long live the mathematicians. You say something about adding the tensors of g^0 and g^1 , but the T $_{mu nu}$ of g^0 is zero. In your last paragraph, again, you talk of "a tensor of Riemann space". Bar that, we don't want to use such tensors. There's another approach one can try, starting from the Einstein tensor

Also I have a doubt that you use mathematics of Riemannian geometry correctly in the case of your explanation of the concept of the energymomentum in GR. It is conceptually incorrect to present a tensor of Riemannian space g_ik as the sum of two non-tensor quantities g^0_ik (Minkowski metric) and g^1_ik -additional non-tensor term of the Riemannian space.

The general mistake for such "background" explanations is that the sum of two tensor quantities of the Minkowski space is the new tensor of the same Minkowski space, so it cannot be a tensor of Riemannian space. It is clear from the fact that the trace of the metric tensor is equals to g_ik g^ik = 4, while the sum of Minkowski metric with tensor Psi_ik is 4 + Psi. So the geometric gravity theory is principally different from the field gravity theory in Minkowski space (where Psi is the trace of the Psi ik).

Though all existing relativistic gravity experiments/observations has the same values in both geometrical and field gravity theories, there are predicted new effects which can distiguish between these theories.

Gerard t Hooft + # 33.92 + # 240.59 + Universiteit Utrecht

@Arno, in contrast to the impressions you might obtain from this blog, there is firm agreement among the experts as to how to describe observations, and how to interpret what we see. There are also disagreements, but at a level far deeper than the discussions that you find here, unfortunately.

@Michael: I'm afraid peer review is not perfect. Big bang theory will not be invalidated by one preprint. There are so many preprints of that nature. The community will ignore all of them. Sorry.



Victor Ostrovskii · II 40.37 · II 84.24 · Karpov Institute of Physical Chemistry

Gerald, I am sorry for the intervention.

Apparently, you are in error. The following statement is principal and doesn't relate to any selected subject. The laws of logic say that one correct syllogism may be sufficient to disprove an erroneous affirmation. It's another matter that the author of the erroneous affirmation may put on a show that he didn't understand the disproof or may not understand it really.

@Victor. The one problem in your argument is the word "correct". Arguing from the numerous indications scientists have in favour of the big bang, one would "logically" conclude that the syllogism I presume you talk about must be incorrect. And, @Victor, in science we meet very many little boys shouting all sorts of nonsense about science. The hard truth is that science is not like the fairy tale.

@Michael, the fact that this paper tunneled through the peer review system after two years is no guarantee that it is correct. Some people will read it, and if the paper carries any substance they will investigate what its implications are. Instead of making my prediction right now I ask you for the reference of the paper.

Demetris Christopoulos \cdot al 30.39 \cdot National and Kapodistrian University of Athens

Since the discussion has both a technical and a theoretical background, I want to intervene and argue that:

First version:

If GR has a power to explain gravity, then we should wait outside a massive star to hold T_munu\neq{0} and this source would cause the other objects (a planet for example) to freely fall in a geodesic defined by that T_munu\neq{0} according to the main GR equation. If T_munu = 0 at the orbit of a planet, then what is the cause for that observed orbit? Why should the planet rotate around the massive star and not move in a linear motion (for example), getting away from the star?

An alternative and more physically based approach is the Second version:

If we accept that T_munu of a star is localized at the region where the star exists, then, in order for GR equation to have explanatory power for gravity, it must holds that G_munu at the orbit of the planet should be affected by that (a distance away existed) T_munu \neq{0} of the star. Otherwise, the planet is inside a vacuum of T_munu=0 and no reason to be in an orbit around the star.

Thus GR equation cannot explain gravity.

We can discuss about technical details as long as we want, but if a theory cannot explain what is expected to do, then we have a serious problem, my opinion.



Yurij V. Baryshev - # 35.66 - # 88.7 - Saint Petersburg State University

@ Gerard, I am very sorry, but again you use wrong physical concepts to discuss energy density of the relativistic field.

According to Lagrangian formalism of the relativistic field theory the action of the system of a field and its sources (e.g. particles) is the sum of 3 parts: action for the field + action for interaction + action for particles. In the frame of Lagrangian formalism each part of the action relates to the corresponding energy-momentum tensor: for the field, for the interaction and for the particles.

The basic physical concept of the field theory is that the energy density of any field having integer spin (scalar, or photon) is positive $T_00 > 0$, while energy density of interaction can be positive or negative depending on sign of the production Fi x rho (potential x particle density).

It is well-known that the energy density of the electric field is positive for both positive and negative charges ((grad fi)^a2/8pi), while he interaction energy density (which is analog of the classical potential energy) can be positive or negative depending on repulsion or attractive force.

So, this is why in the frame of the relativistic field theory the energy density of the gravitational field around a massive body must be POSITIVE (gravitons correspond particles with spin 2). The negative energy density corresponds to the energy-momentum of the interaction and exist only inside the body (binding energy of the body). So the statement in the abstract of my paper is absolutely correct and please read the main text too. You just confused two different concepts (energy of the field and energy of the interaction) and use argument of classical mechanics (negative potential energy) where there is no physical concept of the field, instead of relativistic field theory. Please let me know that you have realized this difference.

@ Demetris, your question about the gravity field outside a massive body is very important. It directly related to our discussions with Gerard. The positive energy of the gravitational field outside a body is the mathematical fact of the relativistic field theory and equals to (grad fi)^2/8PiG (for static spherical body). In the language of quantum field the cause of gravity is the exchange of gravitons between bodies. So within the Feynman's field gravity approach there is no such paradox as you mention.

By the way to use the pseudotensors in GR is always confusing. For example according to the Einstein's pseudotensor the energy density of the gravity field around massive body is positive but according to Landau&Lifshitz pseudotensor it is negative.

Also geometrical GR lost the scalar part of the symmetric tensor potential (its trace).

This is why I prefer the Feynman's Field approach to gravitation and as an astrophysicist developed some crucial observational tests to distinguish between geometrical and field theories of gravitational interaction.

@ Stephen, your arguments is not convincing. Actually they present a mixture of true and false statements and it is a hard work (too long discussion) to disentangle them from each other.

Gerard t Hooft + # 33.92 + # 240.59 + Universiteit Utrecht

@Arno: those mathematicians wold be asking exactly the same questions as physicists do, but in a different language. We all want to see equations for natural phenomena that make sense and can be applied to all circumstaces.

@Demetris: You have that wrong. $G_{munu}=T_{munu}=0$ in some region does not mean that local spacetime is flat and geodesics are straight. At all points outside the star, the GR equations say $G_{munu}=T_{munu}=0$, while solving these equations gives the gravitational field and causes geodesics to be curved. The fact that the gravitational field does not vanish arises from the boundary condition at where the star is. Not G_{munu} is affected by the star at a distance, but the Riemann tensor

R_{mu nu alpha beta}. G and T vanish outside the star, but not R. So your last two sentences are entirely misplaced.



Stephen Crothers - III 13.05 - III 5.52 - Alpha Institute of Advanced Study

(1) 't Hooft said: "Crothers' (b) and (c) are repetitions of what he said earlier, and are to be ignored. Robitaille is one ill-informed opinion against hundreds of others."

This is patently false 't Hooft. You command people to ignore the facts because you don't like them and don't understand them. Since matter cannot be both present and absent by the very same mathematical constraint, it follows that Einstein's field equations must take a form that violates the usual conservation laws of energy and momentum for a closed system. As I said, there are a number of other contradictions in GR that each alone invalidates it. The foregoing is such a contradiction. One does not even need to avail of the non-existence of first-order intrinsic differential invariants, which the pure mathematicians proved long ago do not exist.

Also, you again adduce not a single scientific argument to support your vagarious assertion that Professor "*Robitaille is one ill-informed opinion against hundreds of others.*" This is again just your usual arrogant disposition to command rather than analyse. It is clear that you have not studied Professor Robitaille's papers. Instead of letting your malicious mouth run wild, produce evidence for you accusations against Professor Robitaille.
There is certainly no CMB and the alleged measurements of it are therefore total fantasies. If you are going to vilify Professor Robitaille I suggest that you first understand his analysis. You know nothing of his work. You just shoot your mouth off at will. Without the CMB the Big Bang creationism is finished. Creationism is not science.

(2) 't Hooft said: "@Yurij. I know, and certainly agree, that the stressenergy-momentum-tensor I have been talking about all the time is a pseudotensor, in the sense that it does not transform as a true tensor under general coordinate transformations. If I ever gave the impression that it should transform as a true tensor then I have to correct that. It does not. But then you say that, because of that, energy and momentum for gravitational waves are not conserved. Crothers thinks the same thing in his answer (a)."

You are not telling the truth again 't Hooft. I made no specific mention of the so-called 'pseudotensor' in (a) in my previous post. The violation of the usual conservation laws for a closed system is proven by various inconsistencies in GR - see (1) above for such an instance. I point out yet again, what you say I say 't Hooft and what I in fact say are two very different things. Your invent things for your convenience.

(3) Yurij Baryshev, I have made no false statements. All black hole universes are in fact defined in part by an asymptotic process, and this very process leads to the situation that black hole universes become both asymptotically something and asymptotically nothing simultaneously, which is rubbish. This of itself completely ruins black hole theory, without any need of calculations.

Similarly, the other numerous inconsistencies in GR, each alone, ultimately prove that it violates the usual conservation laws for a closed

system and is therefore in conflict with a vast array of experiments. This result can't be escaped by means of any so-called 'pseudotensor'. That the so-called 'pseudotensor' transforms 'like a tensor' only under linear transformations of coordinates does not make it a tensor. Such a restriction violates Einstein's requirement that the equations of physics are to be covariant under tensor transformations in order to be independent of coordinate systems; but this is not needed to prove GR violation of the usual conservation laws for a closed system.