Gerardus ‘t Hooft, Nobel Laureate, On Black Hole Perturbations

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ABSTRACT

Professor Gerardus ‘t Hooft, Nobel Laureate in Physics, Editor-in-Chief of the journal *Foundations of Physics,* has again brought attention to my work on black hole theory, big bang cosmology, and General Relativity, by means of his personal website, providing me thereby with the opportunity to address his most recent comments, particularly on black holes. Black hole universes are either asymptotically flat or asymptotically curved, by definition, and so there can be no universe containing multiple black holes.

I. Introduction

The Utrecht professor and Editor-in-Chief of the journal *Foundations in Physics*, Nobel Laureate, Gerardus ‘t Hooft, first brought wide attention to my work in 2010 on his personal website [1]. Very recently I wrote a paper [2] addressing the many issues he has raised. Subsequent to the appearance of [2] Mr. ‘t Hooft soon made more remarks on his webpage [1] but he has not offered anything new or reported accurately on [2] and so I address these matters briefly herein, despite the repetition.

II. Context

Mr. ‘t Hooft [1] says of [2],

“*The text reiterates much of the nonsense we saw before, ornamented with numerous citations out of context.*”

However, all the quotations of Mr. ‘t Hooft in [2] I have taken directly from his writings, with full references provided for reader verification. Nothing is “*out of context*”, as any reader can affirm by consulting [2]. Mr. ‘t Hooft does not explain to his readers how my quotes from his writings are “*out of context*”. He simply makes another unsubstantiated allegation.

III. Multiple black holes

Mr. ‘t Hooft invokes his usual method of mockery, but it is not and never will be a scientific method, and says this about me,

“*Just because gravity is non-linear, you can't have more than one black hole in the entire universe, is one of the messages. In a systematic perturbation expansion one can compute the interactions, due to non-linearity, between black holes. This, however, is something he does not want to hear about.*”

Mr. ‘t Hooft has incorrectly reported my argument despite it being very plain in [2], where I clearly remark that multiple black holes cannot exist according to their very theory because all black hole universes are either asymptotically flat or asymptotically curved. Mr. ‘t Hooft’s “*Just because gravity is non-linear, you can't have more than one black hole in the entire universe, is one of the messages*” is his invention

which he falsely attributes to me, since it does not occur in my paper. Finally, Mr. 't Hooft's assertion violates the most simple aspect of black hole theory. It is clearly explained in [2] that all alleged black hole universes are indeed independent universes because they are by definition either asymptotically flat or asymptotically curved. There is no bound on asymptotic, for otherwise it would not be asymptotic. Without this asymptotic condition the mathematical expressions purporting black holes do not obtain. It must therefore be applied at all times when talking of black hole universes.

It is quite impossible to carry out "*a systematic perturbation expansion"* to *"compute the interactions, due to non-linearity, between black holes"*. Let **X** be some black hole universe. It is therefore necessarily either asymptotically flat or asymptotically curved. Apply some kind of "*perturbation expansion*" as Mr. 't Hooft supposes. This cannot generate another black hole **Y**, presuppose the presence of both **X** and **Y**, or describe an interaction between **X** and **Y**. If **Y** is a black hole then it too, by definition, must be a universe that is either asymptotically flat or asymptotically curved. Hence Mr. 't Hooft's perturbation generated black hole interaction universe **X + Y** is not asymptotically anything because the presence of **X** destroys the asymptotic nature of the universe of **Y** and the presence of **Y** destroys the asymptotic nature of the universe of **X** thereby violating the very defining asymptotic character of a black hole universe. This was all explained in detail in [2] and so readers are referred thereto.

Similarly, black hole universes are inconsistent with big bang universes by their very definitions (see [2]), and so Mr' 't Hooft's impossible multiple black hole universe cannot coexist within any of the three alleged different big bang universes either (Mr. 't Hooft presupposes that his multiple black holes persist in some unspecified big bang universe). All three types of big bang universes are not asymptotically anything.

IV. Big bang creationism

Mr. 't Hooft mocks me yet again, thus

"*Big Bang Theory is creationism, is another message. What's the alternative? A steady state universe*?"

As explained in detail in [2], big bang cosmology is a form of creationism. Indeed, it is *creation ex nihilo*, that is, the astrophysical scientists assert that the Universe created itself from absolutely nothing! Mr. 't Hooft therefore advocates a form of creationism. It is evident that he does not like the word 'creationism' being applied to big bang, but it is a fundamental feature of big bang cosmology nevertheless. Consequently, big bang cosmology is not science.

V. Einstein's gravity is not a force

Einstein's gravity is not a force because it is spacetime curvature. Nonetheless, Mr. 't Hooft once again uses Newtonian gravitational forces to produce his black hole. According to Mr. 't Hooft [1],

"*And what's the alternative to black holes? Perhaps even Mr. C can solve the equations as to what happens when a large spherical body made of dust collapses under its own weight*."

Weight is the Newtonian force of gravity on some mass. It cannot therefore be invoked to do anything in Einstein's warped spacetime universe. This too was explained in [2].

VI. Black hole singularity

According to Mr. 't Hooft [1],

"*Central singularity? Yes, it's physical for an observer who travels inside the black hole, since he will be killed by it. Outside observers don't notice a thing. Again, whether or not you still want to call that physical is a linguistic problem.*"

However, as explained in detail in [2], black hole theory asserts that all black holes have a finite mass and an infinitely dense singularity where spacetime is infinitely curved. Since Einstein's gravity is spacetime curvature it necessarily follows that gravity is infinite at the black hole singularity. But no finite mass possesses infinite gravity, contrary to Mr. 't Hooft's claims. Mr. 't Hooft [1] attempts to evade these issues by means of his 'linguistics'.

VII. Black hole radius

It is revealed in [2] in no uncertain terms that Mr. 't Hooft, as do all proponents of black holes, confounds radii, and distance generally, with mathematical entities that are not even distances let alone radii. But he attempts to evade this issue by simply calling it a "*non-issue*" [1]; in violation of pure mathematics.

VIII. Omissions

Mr. 't Hooft's latest comments are overwhelmed by what he did not say. Readers can consult [2] for a detailed list of Mr. 't Hooft's numerous omissions.

References

[1] 't Hooft, G., Strange Misconceptions of General Relativity, http://www.staff.science.uu.nl/~hooft101/gravitating_misconceptions.html

[2] Crothers, S. J., General Relativity: In Acknowledgement Of Professor Gerardus 't Hooft, Nobel Laureate, http://vixra.org/abs/1409.0072