

Robert Geroch

PROFESSOR of PHYSICS

University of Chicago

Email Correspondence

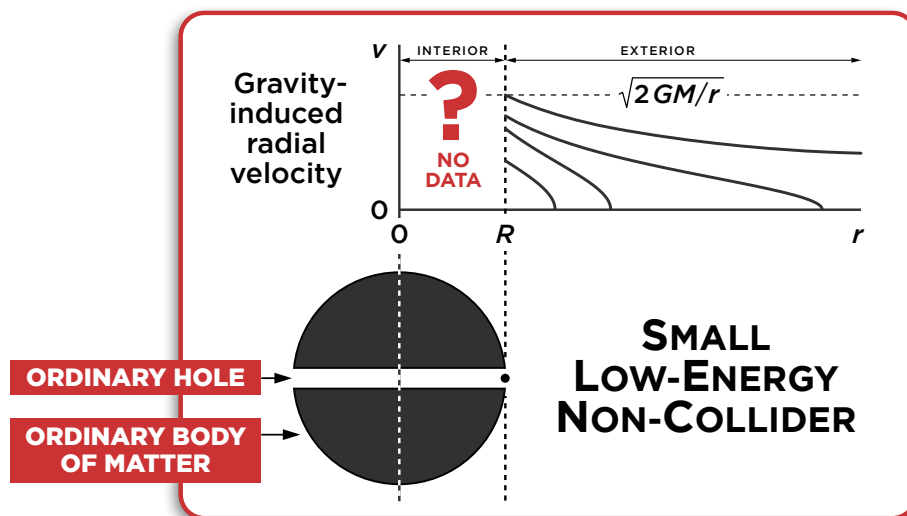
January 6 – 11, 2016

PREFACE

I had not yet learned the word, *gaslighting* when this dialog took place. Looking back on it, my question now is whether Geroch began his reply with the intent to gaslight me or it just got more irresistible for him as the correspondence unfolded.

Until just before the end, I consistently gave Geroch the benefit of the doubt, even as he struck me as opaque, obstinate, and practiced in the art of missing the point. It all comes down to this: Geroch proposes that the absence of authoritative desire to perform Galileo's Small Low-Energy Non-Collider experiment is explainable by an absurd analogy.

Geroch argues (more like it, *plays*) the idea that the huge interior/exterior data gap (big red question mark) can be likened to the gaps pertaining to any experiment that fails to account for the *color* of the test mass or for which barnyard animals may be watching at the time it is performed (no kidding). He refuses to acknowledge the "insight" to be gained by doing Galileo's experiment—even if it only confirms the standard prediction.



Doing the experiment would give all physics instructors and others who discuss the problem as a *thought* experiment the data needed to give *substance* to the question as one that has been answered by *real empirical evidence* (no longer *just* a thought experiment). This would *obviously* be a significant step in the progress of science. Nature's say in the matter would at last have been witnessed and recorded. Alas, Geroch effectively ridicules the insight to be gained by the direct probe of Nature, by a probe designed to turn the big red question mark into concrete data.

If only Geroch's fervor for messing with me could be re-channeled to fuel some basic scientific curiosity. But no. Such a waste. Such a snotty, disrespectful waste.

To: geroch@uchicago.edu
From: Richard J Benish <rjbenish@comcast.net>
Subject: Galileo's Gravity Experiment
Attachments: <Galileo's-Related-Experiment.pdf> <Gravity-Sociology.pdf>

Dear Professor Geroch,

I hope you find the attached documents to be within your scope of interest.

I'd be grateful for any feedback.

Thanks for your good work.

Sincerely,

Richard Benish

On Thu Jan 7 2016 at 9:12 AM Robert Geroch <geroch@uchicago.edu> wrote:

Richard Benish,

Thanks for your message, and for the copy of your paper. Presumably, the experiment you propose has not been done, and I certainly agree with you that the result, if it were done, might be surprising.





But there is also a problem here. It is easy to invent millions of experiments that have not been done, such that the result, if they were done, might be surprising. For example: **Nobody (as far as I know!) has measured the acceleration of gravity by dropping a billiard ball painted blue with orange spots, all the while witnessed by a male duck. Why not carry out this experiment?**

The point I am trying to make is that one must choose which experiments one will do — there isn't time to do them all.

Thus, the failure to do the experiment you propose may not be because scientists are self-assured, or lack scientific rigor: It may only be that they are off doing experiments that they regard as more promising. And your burden, again in my opinion, is to argue, not merely that your experiment has not been performed and may give a surprising result, but also that the likelihood that it will give a surprising result is higher than that for various alternative experiments.

I hope that these remarks are of some use to you.

Robert Geroch

To: geroch@uchicago.edu
From: Richard J Benish <rjbenish@comcast.net>
Subject: Galileo's Gravity Experiment
Attachments:  Geroch Email Out Jan 9 2016.pdf  Maximum Force Nov 17 2011.pdf
 Max Force Annotation.pdf  Rethinking-Rotation-Sep-5-2012.pdf

On Thu Jan 9 2016 at 11:12 AM Richard J Benish <rjbenish@comcast.net> wrote:

Dear Professor Geroch,
Many thanks for your thoughtful reply.
Due to length and readability concerns, I've reformatted my response as a pdf attachment (Geroch Email...). Please read it.
Thanks again.
Best regards,
Richard Benish

On Thu Jan 10 2016 at 6:52 AM Robert Geroch <geroch@uchicago.edu> wrote:

Richard (if I may),
Look, I don't think that I'm a very good correspondent for these matters, for I'm not an experimentalist, and I'm not particularly skilled at judging which experiments are "worthwhile".
My introducing the experiment of the painted billiard-ball observed by a male duck was intended, not to belittle your experiment, but only to make one, tiny point:
You have, in my opinion, the burden of arguing, not merely that your experiment hasn't been done, and that it might yield an interesting result. You must also argue that this experiment is more promising (in terms of the insight it will yield) than various other, alternative, experiments.
I don't know how to make this point any clearer than this, but let me take one more shot at it.
Suppose that I pressed you to work on my billiard ball/duck experiment. I would argue that gravity is supposed to work independently of the color of the billiard ball and of which animals are watching, but we have virtually no data to support this supposition. This is a gap in the empirical evidence. We need to acknowledge such gaps, and fill them. To fail to do so, using instead mere mental extrapolation would be fraught with serious errors. **A major reason this hasn't been done is that Galileo made no mention of animals watching his experiment,** so people merely <assume> that this factor is irrelevant. Indeed, in every case I know of in which falling bodies are discussed, there is no mention of their color or who is watching. Confidence in the presumed answer is probably due to the track record of well-worn theories. However none of these theories have been <tested> in the regime of various colors of the billiard ball and various animals

observing the falling billiard ball. The absence of any evidence on this issue is conspicuously unmentioned in every one of the many scientific treatments of this problem. History is full of experiments whose purpose is merely to improve accuracy. So, why not carry out the accuracy-improvement reflected in this experiment. The burden here is not on me — to argue that there is something interesting about this experiment — but on the authorities. They maintain the status quo opinion, offering abstract “solutions” that are not backed up by any direct physical evidence. This experiment (and some others I have ready) should be done for the sake of scientific completeness. If Galileo were around today, and this experiment were suggested, do you think he would say “Nah, why bother? We already knows what happens.”?

Well, you get the idea ... I am NOT trying (of course!) to argue that my experiment is on a par with yours, nor am I trying to make fun of your experiment. What I AM saying is that you have the burden to make an actual argument for this experiment, and not merely the stuff of the paragraph above. As I said before, I'm not a good judge of these things. But for me, an “actual argument” would begin with a viable, alternative theory of gravity, that makes a different prediction from the standard one. Then, at least, we would know what we are looking for ...

Robert

Addendum

On Thu Jan 10 2016 at 8:12 AM Robert Geroch <geroch@uchicago.edu> wrote:

Let me try to say this in a (slightly) different way. I think that I've made a pretty good case for carrying out my experiment. This is an experiment that you could perform. Are you willing, in the interest of completeness in science, to carry out my experiment? If not, why not?

Robert

Robert Geroch, 1/11/16 8:34 AM -0800, Re: Addendum

4

To: Robert Geroch <geroch@uchicago.edu>
 From: Richard J Benish <rjbenish@comcast.net>
 Subject: Re: Addendum
 Attachments: <Clock-Rates-GR-vs-SGM-Weak.pdf> <SLENC w Graph & Caption.pdf>
 <Clock-Rate-GR-SGM.pdf>

Dear Professor Geroch,

Thanks for your comments and questions.

I would have no interest in carrying out your experiment because you have ill-advisedly shifted focus from the SOURCE MASS to the test object. As you know, very many experiments have demonstrated that test masses having a wide variety of properties (substance, color, etc.) behave under gravity with no regard to such properties.

Recall that the main argument for dismissing your absurd suggestion is that it neglects to consider—as does your reply and addendum—the graph in Figure 1. This graph is all about the SOURCE MASS. I.e., the material body having the dominant role in any nearby gravitational effects.

The “stuff” of the paragraphs urging to do Galileo’s experiment and proposing to explain lack of interest in doing it as products of unscientific “folk memory,” etc. all pertain to the HUGE gap in this graph. We have lots of data establishing that the detailed properties of test masses are irrelevant. But we have NO DATA pertaining to gravity-induced radial motion through the centers of massive bodies.

Standard wisdom—borne of our favorite theories of gravity—states that the test object oscillates in the hole. But we have never OBSERVED what happens in the hole—not even as a first approximation. Our favorite theories of gravity have not been tested here.

“Science advances by exploring unexplored regions and by performing critical tests of standard wisdom.” I maintain that SUFFICIENT reason to take the trouble to do Galileo’s experiment is that the gap is very large (the most ponderous half of the gravitational Universe); it is unexplored, and with respect to it, tests of standard wisdom have not yet been carried out. It is obvious that science will make an appreciable advance by filling this conspicuously large gap.

Far smaller gaps and much tinier regions of the unknown (far down the line of decimal places) have sufficed to fund some extremely fancy and expensive experiments. For some reason you place more stringent and demanding requirements on the idea of doing the fundamental experiment proposed by the Father of Modern Science. Why not help to generate interest in doing this experiment for the simple, patently scientific reasons I’ve presented? Aren’t you at all curious? Wouldn’t it be cool to watch a Small Low-Energy Non-Collider in action?

If you insist on maintaining an exceptionally high standard for Galileo and his experiment, then I should point out that the papers sent last time do present the basis for what I have argued is a viable alternative model of gravity. The most unequivocal test of the model would be one that probes the interior of massive bodies. The model is demonstrably in agreement with data that supports the Schwarzschild exterior solution, but its predictions deviate dramatically from those of the Schwarzschild interior solution. I’ve attached graphs of key predictions.

I am grateful for your questions and the opportunity to answer them.

Best regards,

Richard Benish

On Thu Jan 11 2016 at 10:37 AM Robert Geroch <geroch@uchicago.edu> wrote:

I would have no interest in carrying out your experiment because you have ill-advisedly shifted focus from the SOURCE MASS to the test object.

Exactly. And your experiment shifts focus from other experiments that also might be performed. And your burden is to argue that this shift of focus is a good idea.

As you know, very many experiments have demonstrated that test masses having a wide variety of properties (substance, color, etc.) behave under gravity with no regard to such properties.

But my experiment (blue, orange polka dots, male duck) has NEVER been performed. Are you just saying that my experiment “won’t yield anything new,” based on some unjustified extrapolation from other experiments? What about completeness in science?

Robert

From: Robert Geroch <geroch@uchicago.edu>
To: Richard J Benish <rjbenish@comcast.net>
Subject: Re: Addendum

I think I have rather effectively argued that the shift in focus to a huge, unexplored, yet accessible domain of physical reality is a good idea. When, in science, is that not a good idea? I rest my case on the factual content of Figure 1.

The issue of the acceleration of gravity when watched by various barnyard animals is also a huge, unexplored, yet accessible domain of physical reality. I take it, then, that you would agree that a shift in focus to this area is a good idea ...

Robert Geroch, 1/11/16 2:35 PM -0800, Re: Addendum

Dear Professor Geroch,

If you define “hugeness” by the number of absurd and trivial conceivable variations of a given experiment, then you might have a point.

Obviously—I mean really, quite obviously—that’s not the sense of “huge” that I intend. By huge, I mean the physical domain INSIDE any body of matter. What we think we know about gravity-induced radial motion is based entirely on observations OUTSIDE bodies of matter.

We have not yet gathered empirical evidence for gravity-induced radial motion from the huge domain inside and through the centers of massive bodies. You seem intent on either missing this point or equating it with gnat poo.

This dialog therefore suffers from more than one kind of blind spot. I have failed in my efforts to divert your attention from your bizarre examples of barnyard animals to serious problems in gravitational physics.

It is getting tiresome. Goodbye.

Richard Benish

Robert Geroch

Updated on Jan 10, 2018

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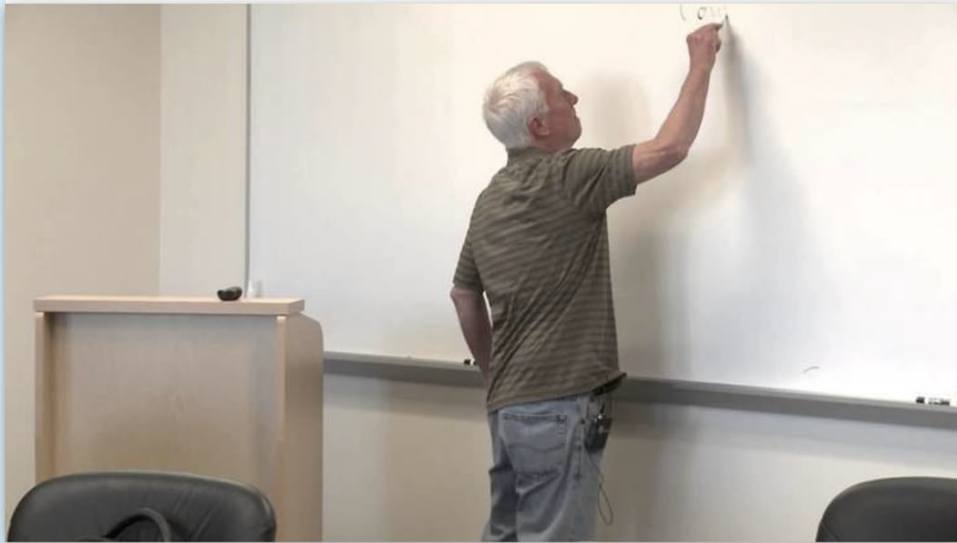
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Name Robert Geroch

Education Princeton University

Role Physicist



Books General relativity from A to B, Perspectives in Computation, Mathematical physics, Topology: 1978 Lecture N, Quantum Field Theory: 1

f Chicago Hillel Latke-Hamantash Debate 2004 (Robert Geroch Part 1)



1:46 / 6:36