Brandeis

Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu>

An ontological argument for the fundamental law of physics

8 messages

Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu> Thu, Jul 11, 2024 at 12:23 PM
To: Graham.Oppy@monash.edu

Dear Prof. Graham Oppy,

I have written the below blog post about the ontological argument. If you have time please read it and tell me any brief (1 or 2 paras) criticism you have.

https://ksr.onl/blog/2024/07/an-ontological-argument-for-fundamental-physics.html

I am a PhD student in string theory, and I am an atheist but also somewhat of a pantheist.

Copypsating the main argument that argues for the existence of the Theory of Everything (ToE).

1. Assume ToE does not exist physically.
2. “ToE” is defined as “the greatest entity in the realm of Platonic Mathematics”. (definition)
3. “The greatest entity in the realm of Platonic Mathematics” must, therefore, not exist physically and exist only Platonically. (from 1 & 2).
4. If “the greatest entity in the realm of Platonic Mathematics” were to exist in physical reality as well as in Platonic Mathematics, it would be even “greater”. (assumption)
5. But that would mean “the greatest entity in the realm of Platonic Mathematics” is not actually the “greatest” entity in the realm of Platonic Mathematics since it could be even “greater”. (from 3 & 4).
6. “The greatest entity in the realm of Platonic Mathematics” must exist in both Platonic Mathematics and also in physical reality for it to be the “greatest” entity in the realm of Platonic Mathematics.
7. Therefore 1 & 2 are inconsistent.
8. Premise 1 cannot be true since 2 is just a definition (reductio ad absurdum).
9. Therefore, the ToE exists in physical reality.

The ontological arguments seem like the only possible explanation for "Why is there anything at all?". If the argument is used for God, you explained that it is not a good argument because atheists can simply dismiss the definition and assumption. But instead of God, if we use it for the laws of physics, then we already have enormous empirical evidence to justify belief in the definition and assumption.

Because of my lack of experience in philosophy, I am asking an expert like you if you can criticize it, so that I can later think if I can improve that argument.

Yours sincerely,
Sreeman.

Graham Oppy <graham.oppy@monash.edu> Wed, Aug 7, 2024 at 5:25 AM
To: Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu>

Hi Sreeeman!

Thanks for your email and question.

It is not clear exactly what is required for a theory to exist. If we think of theories as sets of propositions, and we think of propositions as abstract entities, then we might think of theories as abstract entities. However, it is controversial whether there are propositions (and there is even some controversy about whether there are sets).

Even if we are platonists about mathematical entities, it is not clear that there is any such thing as 'the greatest mathematical entity'. Perhaps the 'largest' mathematical entities are proper classes. But there are many proper classes. So there is nothing that is *the* largest mathematical entity. (Perhaps 'greatest' means something other than 'largest'. But then we need an explanation of what greatness is.)

It is not clear why we should accept that abstract objects would be greater if they somehow 'existed in (physical) reality. I think it is plausible that, if there are platonic entities, it is simply impossible for them to exist in physical reality.

Perhaps, when you talk about ToE, you really mean to be talking about fundamental physical laws. Some of the issues mentioned above recur. We might think that physical laws are just summaries of regularities. I think it would be odd to suppose that physical laws "govern" what happens in the universe: the laws do not have any "causal oomph".

I hope these thoughts are helpful to you.

Cheers,

Graham

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On Thu, 11 Jul 2024 at 16:53, Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu> wrote:

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>
> [Quoted text hidden]

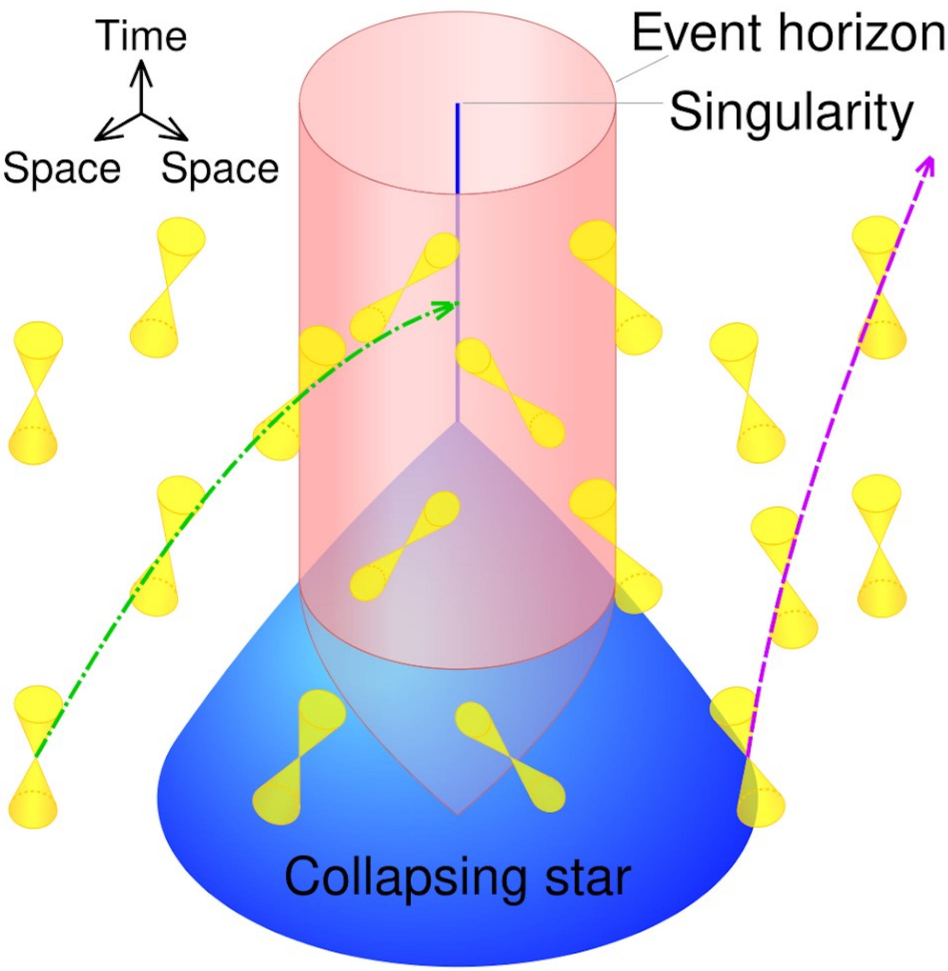
Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu> Wed, Aug 7, 2024 at 1:22 PM
To: Graham Oppy <graham.oppy@monash.edu>

Dear Prof. Graham Oppy,

Thank you for your reply. I do not know much about the controversies surrounding the existence of propositions/sets. I will look into those. But the Quine–Putnam indispensability argument seems to me as enough reason to believe in mathematical Platonism.

About defining the "greatest" mathematical entity, I have given some points in the blog post (but not in the email) where I compare the most important theories and argue which one is greater. But unsatisfactorily, I have not provided a precise algorithm to compare if someone gives arbitrary, unknown theories.

I do think it is appropriate to say that the fundamental law of physics "governs" physical phenomena and causality. In fundamental physics, Causality has a slightly different meaning. An event (point in spacetime) **can** only be caused by events in its past light cone, and it **can** only cause events in its future light cone ("can" but these causal relations are not necessary). When gravity is weak, the causal structure is trivial (i.e., light cones are always at 45 degrees). But near black hole event horizons, they bend significantly, and inside the event horizon, the time direction and radial direction both switch places.



This is all in (classical) general relativity, i.e., this causal structure is applicable only to large objects instead of quantum objects. Quantum gravity is not yet understood but the causal structure in quantum gravity will be even more weird. The below picture from The Road to Reality (a popular science book by Penrose for non-physicists that starts from scratch and explains all established fundamental physics till quantum field theory and ends with speculative quantum gravity theories) compares the causal structure of quantum gravity theories. Most proposed quantum gravity theories (string theory, etc.) have fuzzy light cones like (a), but his Twistor theory has (b).

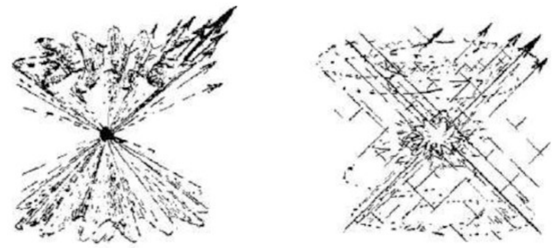


Fig. 33.7 (a) It has been a common viewpoint, with regard to the possible nature of a 'quantized spacetime', that it should be some kind of a spacetime with a 'fuzzy' metric, leading to some sort of 'fuzzy' light cone, where the notion of a direction at a point being null, timelike, or spacelike would be subject to quantum uncertainties. (b) A more 'twistorial' perspective would be to take the twistor space (in this case ℙℕ) to retain some kind of existence (so there would still be light rays), but the condition of their intersection would become subject to quantum uncertainties. Accordingly the notion of 'spacetime point' would instead become 'fuzzy'.

I know in philosophy, causality has a much broader meaning. I am implicitly assuming naturalism that there are no supernatural causes and effects. Once that is assumed, it's appropriate to say that the causal structure of the fundamental theory will "govern" what kind of causes and effects are allowed. Of course, there are many levels of explanations; when ice melts, we can use the theory of thermodynamics to explain that the higher temperature of the surroundings caused it, but we can also use the more fundamental statistical mechanics (from which thermodynamics can be derived) to explain the same using the average velocity of molecules, etc. It is the laws of physics that makes causality to be trivial when gravity is weak but weird near black holes.

Thank you again for your reply.

Yours sincerely,
Sreeman.
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Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu> Wed, Aug 7, 2024 at 3:10 PM
To: Graham Oppy <graham.oppy@monash.edu>

Dear Prof. Graham Oppy,

Though unrelated to the above, I think an underrated objection to Craig's Kalam cosmological argument is that he uses a version of causality that is invalid near singularities. He applies it to the initial singularity, which is similar to but more complicated than the black hole singularities. When we go closer to the singularities, the fluctuations of the light cones will increase (but the exact fluctuations depend on a particular quantum gravity theory, as shown in Penrose's picture). Even in proposed theories, so far, we can only calculate light cone fluctuations somewhat far from the singularity. When we go within Planck length (10^{-35} m) of singularities, the fluctuations will be so high that the causal structure might be much weirder than we currently expect.

Yours sincerely,
Sreeman.
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Graham Oppy <graham.oppy@monash.edu> Thu, Aug 8, 2024 at 12:30 PM
To: Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu>

Hi Sreeman!

I agree with your further comment here. We do not yet have a physics that adequately describes conditions "near" the initial singularity.

I am no fan of the indispensability arguments. I prefer some version of nominalism. Of course, any position here is enormously controversial.

I agree that phenomena "fit" the laws. But I do not think that is enough to justify the claim about "governing". (Again, this is controversial.)

Cheers,

Graham

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On Wed, 7 Aug 2024 at 19:40, Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu> wrote:

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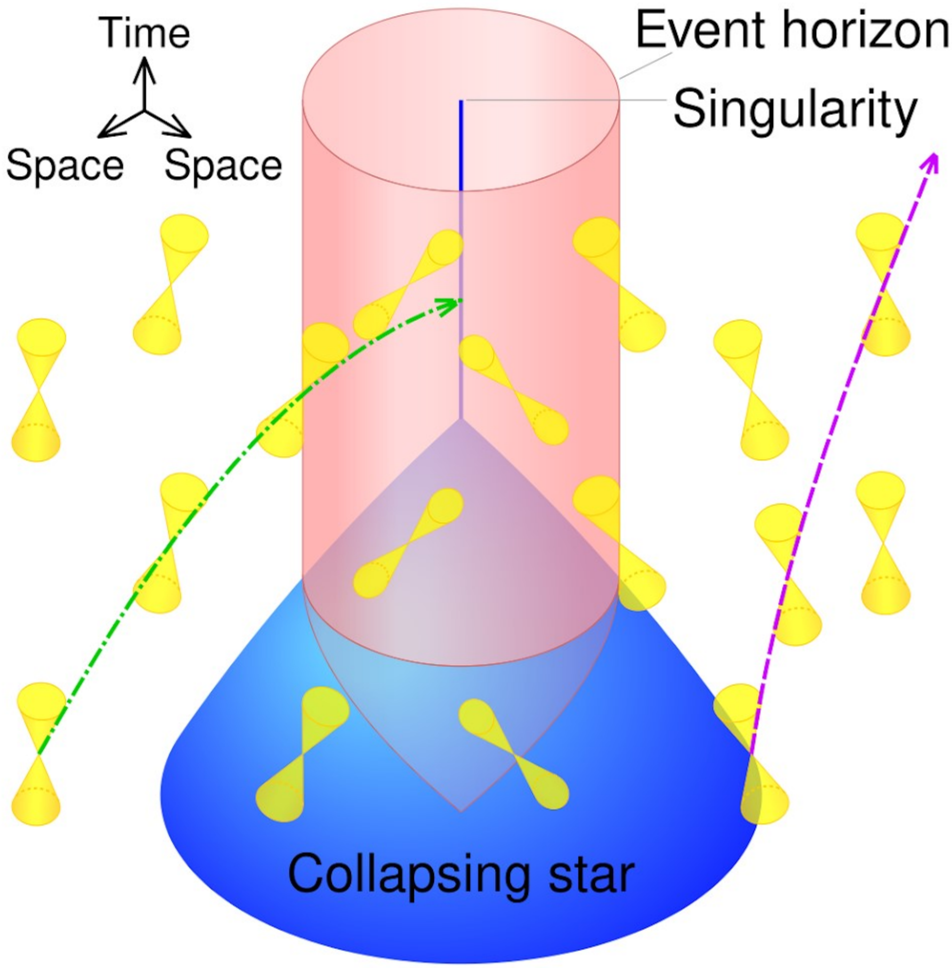

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Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu> Thu, Aug 8, 2024 at 1:11 PM
To: Graham Oppy <graham.oppy@monash.edu>

Dear Prof. Graham Oppy,

Thank you for your reply.

Unrelated: I think it's unfortunate that in philosophy, for every claim, there are always rational people who disagree with it. In science, before experimental evidence comes, there will be a controversy between proponents of proposed theories, but at least the controversy will die after a few decades when the empirical data comes, and people will accept if their theory is falsified. Science has certain dogmas like the 1) scientific method, 2) methodological naturalism, 3) induction (even Popper's falsifiability doesn't completely remove the need for induction), and 4) consistency of important mathematical theories like ZFC set theory, which can't be proved because of Gödel's 2nd incompleteness theorem, etc. But once these dogmas are assumed, science gives objective numbers. Of course, how to interpret the resulting numbers is also controversial, like the interpretations of quantum mechanics (like some interpretations are deterministic but others are probabilistic). Since some parts of philosophy (epistemology, metaphysics etc) are more fundamental than physics, the inconclusiveness in philosophy will also induce some limitations in physics and other sciences.

“Skepticism, while logically impeccable, is psychologically impossible, and there is an element of frivolous insincerity in any philosophy which pretends to accept it.” - Bertrand Russell

Do you think there will ever come a time when philosophy becomes more objective (maybe something like the scientific method for philosophy), or will philosophy be forever inherently skeptical and allows reasonable rational disagreement on every claim?

Yours sincerely,
Sreeman.
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Graham Oppy <graham.oppy@monash.edu> Fri, Aug 9, 2024 at 8:43 AM
To: Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu>

Hi Sreeman!

In my view, what is characteristic of philosophical questions is that (a) there is no expert agreement on the answer, and (b) no expert agreement on the methods to be used in finding an answer. The answering of what were once philosophical questions has led to the many disciplines with which we are familiar. Widespread disagreement about claims and methods in natural philosophy was replaced by expert agreement on [some] claims and [some] methods in physics, chemistry, etc.

Perhaps--especially in normative and evaluative domains--we shall never secure expert agreement on methods and claims. But there are plenty of examples in the past of people who made claims about the impossibility of arriving at expert consensus that turned out to be mistaken. Famously, in the 1820s, there were many well known philosophers who claimed that we could never know what stars are made of. (Of course, somewhat ironically, the means for answering the question had appeared in the previous decade; but the application would not be made for many decades yet.)

I am an optimist; I think that much of what is currently philosophy will eventually become science. But I am open-minded: there may be some philosophical domains that are destined to remain philosophical indefinitely.

Cheers,

Graham

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Sreeman Reddy Kasi Reddy <sreeman@brandeis.edu> Fri, Aug 9, 2024 at 10:23 AM
To: Graham Oppy <graham.oppy@monash.edu>

Dear Prof. Graham Oppy,

Thank you for your reply.

Yours sincerely,
Sreeman.
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