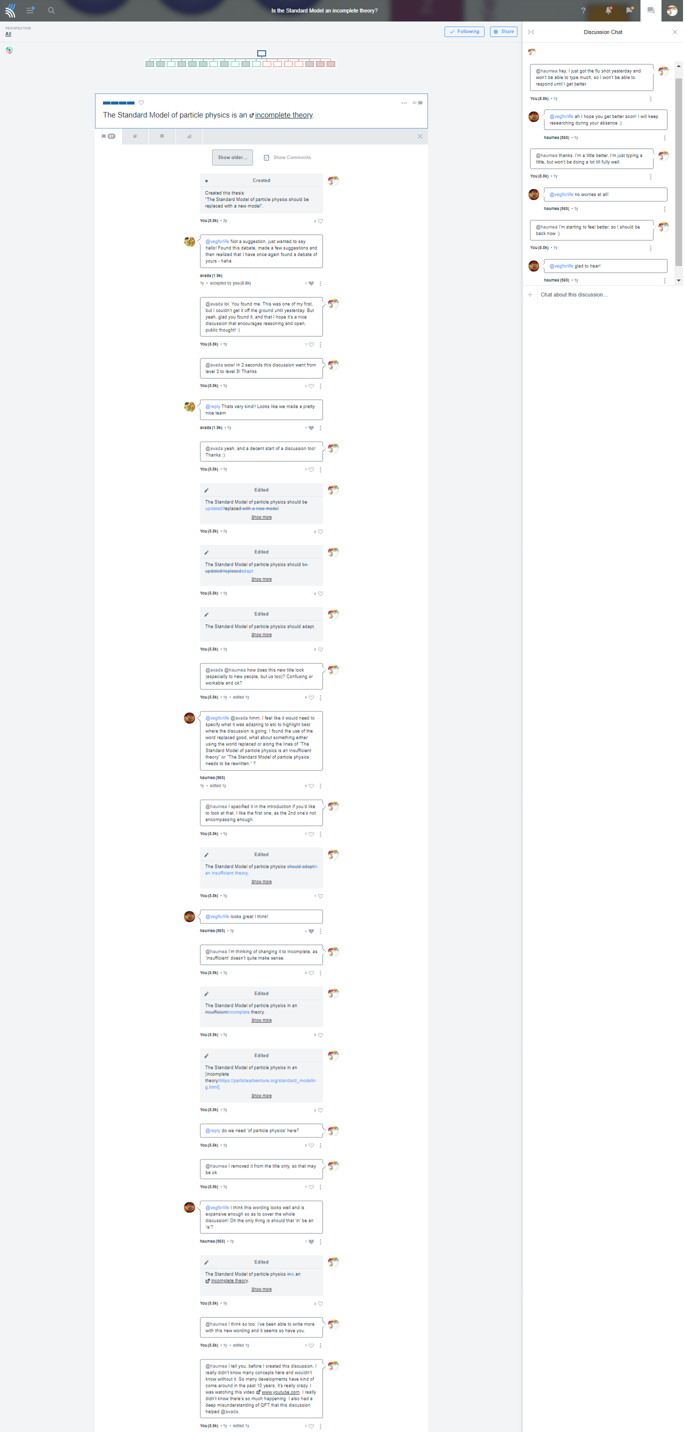


Is the Standard Model an incomplete theory?

The Standard Model of particle physics is an incomplete theory.

Created

Created this thesis:
"The Standard Model of particle physics should be replaced with a new model".

You (8.8k) • 3y 0

@vegforlife Not a suggestion, just wanted to say hello! Found this debate, made a few suggestions and then realized that I have once again found a debate of yours - haha

avada (1.9k)
1y • accepted by you (8.8k) 1

@avada lol. You found me. This was one of my first, but I couldn't get it off the ground until yesterday. But yeah, glad you found it, and that I hope it's a nice discussion that encourages reasoning and open, public thought! :)

You (8.8k) • 1y 1

@avada wow! In 2 seconds this discussion went from level 3 to level 8! Thanks

You (8.8k) • 1y 1

@reply Thats very kind!! Looks like we made a pretty nice team

avada (1.9k) • 1y 1

@avada yeah, and a decent start of a discussion too! Thanks :)

You (8.8k) • 1y 1

Edited

The Standard Model of particle physics should be updated/replaced~~ with a new model~~

Show more

You (8.8k) • 1y 0

Edited

The Standard Model of particle physics should ~~be updated/replaced~~adapt

Show more

You (8.8k) • 1y 0

Edited

The Standard Model of particle physics should adapt.

Show more

You (8.8k) • 1y 0

@avada @haumea how does this new title look (especially to new people, but us too)? Confusing or workable and ok?

You (8.8k) • 1y • edited 1y 0

@vegforlife @avada hmm, I feel like it would need to specify what it was adapting to etc to highlight best where the discussion is going. I found the use of the word replaced good, what about something either using the world replaced or along the lines of "The Standard Model of particle physics is an insufficient theory" or "The Standard Model of particle physics needs to be rewritten." ?

haumea (965)
1y • edited 1y 0

@haumea I specified it in the introduction if you'd like to look at that. I like the first one, as the 2nd one's not encompassing enough.

You (8.8k) • 1y 1

Edited

The Standard Model of particle physics ~~should adapt~~in an insufficient theory.

Show more

You (8.8k) • 1y 1

@vegforlife looks great I think!

haumea (965) • 1y 1

@haumea I'm thinking of changing it to incomplete, as 'insufficient' doesn't quite make sense.

You (8.8k) • 1y 0

Edited

The Standard Model of particle physics in an ~~insufficient~~incomplete theory.

Show more

You (8.8k) • 1y 0

Edited

The Standard Model of particle physics in an [incomplete theory|https://particleadventure.org/standard_modeling.html].

Show more

You (8.8k) • 1y 0

@reply do we need 'of particle physics' here?

You (8.8k) • 1y 0

@haumea I removed it from the title only, so that may be ok

You (8.8k) • 1y 1

@vegforlife I think this wording looks well and is expansive enough so as to cover the whole discussion! Oh the only thing is should that 'in' be an 'is'?

haumea (965) • 1y 1

Edited

The Standard Model of particle physics ~~in~~is an incomplete theory.

Show more

You (8.8k) • 1y 0

@haumea I think so too. I've been able to write more with this new wording and it seems so have you.

You (8.8k) • 1y • edited 1y 1

@haumea I tell you, before I created this discussion, I really didn't know many concepts here and wouldn't know without it. So many developments have kind of come around in the past 10 years, it's really crazy. I was watching this video www.youtube.com. I really didn't know there's so much happening. I also had a deep misunderstanding of QFT that this discussion helped @avada.

You (8.8k) • 1y • edited 1y 1

@haumea hey, I just got the flu shot yesterday and won't be able to type much, so I won't be able to respond until I get better.

You (8.8k) • 1y

@vegforlife ah I hope you get better soon! I will keep researching during your absence :)

haumea (965) • 1y

@haumea thanks. I'm a little better. I'm just typing a little, but won't be doing a lot till fully well.

You (8.8k) • 1y

@vegforlife no worries at all!

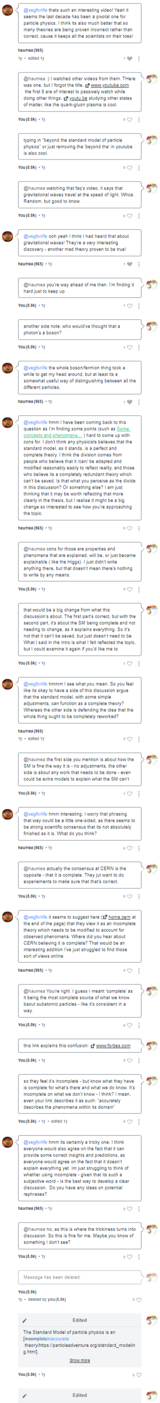
haumea (965) • 1y

@haumea I'm starting to feel better, so I should be back now :)

You (8.8k) • 1y

@vegforlife glad to hear!

haumea (965) • 1y



@vegforlife thats such an interesting video! Yeah it seems the last decade has been a pivotal one for particle physics. I think its also much better that so many theories are being proven incorrect rather than correct, cause it keeps all the scientists on their toes!

haumea (965)
1y • edited 1y 1

@haumea :) I watched other videos from them. THere was one, but I forgot the title. www.youtube.com the first 8 are of interest to passively watch while doing other things. youtu.be studying other states of matter, like the quark-gluon plasma is cool.

You (8.8k) • 1y 0

typing in "beyond the standard model of particle physics" or just removing the 'beyond the' in youtube is also cool.

You (8.8k) • 1y 0

@haumea watching that faq's video, it says that gravitational waves travel at the speed of light. Whoa. Random, but good to know.

You (8.8k) • 1y 0

@vegforlife ooh yeah I think I had heard that about gravitational waves! They're a very interesting discovery - another mad theory proven to be true!

haumea (965) • 1y 1

@haumea you're way ahead of me then. I'm finding it hard just to keep up

You (8.8k) • 1y 1

another side note: who would've thought that a photon's a boson?

You (8.8k) • 1y 1

@vegforlife the whole boson/fermion thing took a while to get my head around, but at least its a somewhat useful way of distinguishing between all the different particles.

haumea (965) • 1y 1

@vegforlife hmm I have been coming back to this question as I'm finding some points (such as Some concepts and phenomena...) hard to come up with cons for. I don't think any physicists believes that the standard model, as it stands, is a perfect and complete theory. I think the division comes from people who believe that it /can/ be adapted and modified reasonably easily to reflect reality, and those who believe its a completely redundant theory which can't be saved. Is that what you perceive as the divide in this discussion? Or something else? I am just thinking that it may be worth reflecting that more clearly in the thesis, but I realise it might be a big change so interested to see how you're approaching the topic.

haumea (965) • 1y 0

@haumea cons for those are properties and phenomena that are explained, will be, or just became explainable (like the Higgs). I just didn't write anything there, but that doesn't mean there's nothing to write by any means.

You (8.8k) • 1y 0

that would be a big change from what this discussion's about. The first part's correct, but with the second part, it's about the SM being complete and not needing to change, as it explains everything. So it's not that it can't be saved, but just doesn't need to be. What I said in the intro is what I felt reflected the topic, but I could examine it again if you'd like me to

You (8.8k) • 1y 1

@vegforlife hmmm I see what you mean. So you feel like its okay to have a side of this discussion argue that the standard model, with some simple adjustments, can function as a complete theory? Whereas the other side is defending the idea that the whole thing ought to be completely reworked?

haumea (965)
1y • edited 1y 0

@haumea the first side you mention is about how the SM is fine the way it is - no adjustments, the other side is about any work that needs to be done - even could be extra models to explain what the SM can't

You (8.8k) • 1y 1

@vegforlife hmm interesting. I worry that phrasing that way could be a little one-sided, as there seems to be strong scientific consensus that its not absolutely finished as it is. What do you think?

haumea (965) • 1y 0

@haumea actually the consensus at CERN is the opposite - that it is complete. They jut want to do experiements to make sure that that's correct.

You (8.8k) • 1y 0

@vegforlife it seems to suggest here (home.cern at the end of the page) that they view it as an incomplete theory which needs to be modified to account for observed phenomena. Where did you hear about CERN believing it is complete? That would be an interesting addition I've just struggled to find those sort of views online

haumea (965) • 1y 0

@haumea You're right. I guess I meant 'complete' as it being the most complete source of what we know baout subatomic particles - like it's consistent in a way.

You (8.8k) • 1y 0

this link explains this confusion: www.forbes.com

You (8.8k) • 1y 0

so they feel it's incomplete - but know what they have is complete for what's there and what we do know. It's incomplete on what we don't know - I think? I mean, even your link describes it as such: "accurately describes the phenomena within its domain"

You (8.8k) • 1y • edited 1y 0

@vegforlife hmm its certainly a tricky one. I think everyone would also agree on the fact that it can provide some correct insights and predictions, as everyone would agree on the fact that it doesn't explain everything yet. Im just struggling to think of whether using incomplete - given that its such a subjective word - is the best way to develop a clear discussion. Do you have any ideas on potential rephrases?

haumea (965) • 1y 0

@haumea no, as this is where the trickiness turns into discussion. So this is fine for me. Maybe you know of something I don't see?

You (8.8k) • 1y 0

Message has been deleted.

You (8.8k)
1y • deleted by you (8.8k) 0

Edited

The Standard Model of particle physics is an [~~incomplete~~inaccurate theory|https://particleadventure.org/standard_modeling.html].

Show more

You (8.8k) • 1y 0

Edited

The Standard Model of particle physics is an [inaccurate/incomplete theory|https://particleadventure.org/standard_modeling.html].

Show more

You (8.8k) • 1y 0

Edited

The Standard Model of particle physics is an [~~inaccurate/~~incomplete theory|https://particleadventure.org/standard_modeling.html].

Show more

You (8.8k) • 1y 0

Write a comment…

Pros

7

Some concepts and phenomena are missing from the Standard Model.

In the end, it's a theory, not fact (because we don't know it's true with certainty); so that makes it inherently insufficient for our understanding.

The Standard Model rests on many assumptions (see pg 10) to make it work (regardless of whether or not they actually do), and some don't hold up.

Its missing particle properties, which creates issues.

Being from the 1970s, the Standard Model may be (or become) outdated, as it doesn't keep up with newer advancements that continue to appear.

The Standard Model does not encompass recent findings.

2

More progress will appear in the future, so the Standard Model should be made to be more flexible to adapt and handle this incoming progress.

9

The Standard Model is missing physics concepts that it should have in it.

There are other models that are more encompassing.

There are more particle colliders being made for even more discoveries.

The Standard Model would benefit from an addition of particles not found on it.

Cons

9

It's complete, but should highlight its information more visually for people to realize it.

The Standard Model accounts for other physics concepts without conflicting with them.

The Standard Model's insights has lead to many successful experiments with findings that confirm it.

The name stands out, which helps keep it alive and physics progressing, so it shouldn't change.

3

Supersymmetry failed, so this lowers the need to rewrite the Standard Model.

1

Since the early 1970s, the Standard Model has successfully explained almost all experimental results and precisely predicted a wide variety of phenomena.

Many new findings from CERN align with the Standard Model.

Related Discussions

Stereotype Threat
Cultural Competence
Privilege
Unconscious Bias
Critical Race Theory
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Research Questions and Methods
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37 93 0 7 208

nimchimpsky commented on a claim 7h

Governments should structure fiscal policy in line with Modern Monetary Theory (MMT) to better manage their economy.

54 121 2 6 454

genecat accepted a suggestion 5d

POLICE
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140 589 146 22 1.7k

mrsjobs replied to a suggestion 2y

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