Particle World - Q&A

Registrants Book

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Shusaku Arakuta

#38

Registration details

Registration date: 30 Jun 2021, 11:41

Registration state: Completed

Personal Data

Email Address: arakuta@champ.hep.sci.osaka-u.ac.jp

Please provide your question(s): I heard there are some kinds of Higgs boson when SUSY theory is valid. What is the difference from standard model?

Alexandre BIGOT

#14

Registration details

Registration date: 29 Jun 2021, 11:18
Registration state: Completed

Personal Data

Email Address: alexandre.bigot@cern.ch

Please provide your question(s): Hello, I have a "terminology" question. We mention the "Exclusion Pauli principle" meaning this can't be proved/justified (by definition of the word "principle"). Yet, as I understand it, one can deduce this exlclusion principle by applying the Symmetrization Postulate on a system of two identical fermions. Then, the Symmetrization Postulate would be a "true" principle (can't be proved/justified, we assume it) while the "Pauli Exclusion Principle" would be a "false" principle (can be found thanks to the Symmetrization Postulate). Could you please tell me if what I just wrote is right or if I'm missing something ? I ask this question in order to better understand the "pillars" on which one can build quantum mechanics and especially the Standard Model (as it's the heart of your lectures). Thanks in advance.

Vaibhavi Gawas

#15

Registration details

Registration date: 29 Jun 2021, 11:24
Registration state: Completed

Personal Data

Email Address: vaibhavi.gawas@cern.ch

Please provide your question(s): How are charges of fermions associated with the hypercharge field? How does hypercharge interact with the fermion field to give charges? 2. the way we have particle and antiparticle fields, same with gluons and photons being their own particles, how do we characterize graviton in the context of its antiparticle

Jana Markovic

#20

Registration details

Registration date: 29 Jun 2021, 19:41
Registration state: Completed

Personal Data

Email Address: jana.markovic@cern.ch

Please provide your question(s): In the lecture notes for this course, you say that if undiscovered forth type of neutrino exists, it would be much heavier then the existing three by a factor of 10^10. Could you explain why? Thanks in advance!

Sebastian Quevedo Diaz #37

Registration details

Registration date: 30 Jun 2021, 11:25
Registration state: Completed

Personal Data

Email Address: sebastian.quevedo.diaz@cern.ch

Please provide your question(s): 1)What properties does a particle with 3/2 spin display? 2) How is the weak force and electromagnetism (hypercharge) united through electroweak theory?

Ida Marie Schmidt   #16

Registration details

Registration date: 29 Jun 2021, 11:35
Registration state: Completed

Personal Data

Email Address: ida.marie.schmidt@cern.ch

Please provide your question(s): Hi! Thank you for the great lecture, it was very well explained and interesting! To get back to the Gravity that is included in the Standard Model: I got that the force itself may be a lot weaker than other forces. You already mentioned the singularities inside BH'S where this becomes a problem. And here's where my actual question starts: how are these singularities covered by the theory of gravitons, and how do gravitons match GR? The interaction strength does not seem to be the same at every space time point, and I do not really understand how this can be described by introducing a new particle. The existence of Gravitational Waves is now a fact and there are some really exciting experiments on that. As far as I got it, GW's are a purely GR induced effect as they merely describe the shaping of the spacetime caused by large masses (the merging of objects with large masses). I wonder how this goes along with something as a particle that should be the result of some other field (qft like)? So long story short: I've only ever learned about gravity as a result of GR and wonder how all the GR properties work together with an additional particle-induced force, especially in respect to GW's. I hope my question is understandable! I barely know about gravitons and only just got started on GW's, so I hope my formulations make sense.

Augustin Vestner

#41

Registration details

Registration date: 30 Jun 2021, 14:09
Registration state: Completed

Personal Data

Email Address: carl.augustin.vestner@cern.ch

Please provide your question(s): Question about gravity and slide 20: If we were to integrate gravity analogously to the other three interactions in the SM via gauge interactions and corresponding particles, how would that work? Would we need 4x4 matrices (with Poincaré group as basic symmetry) for each component of the "magnetic" and "electric" fields and therefore expect 10 different bosons as force carrying particles?

Pavle Vulanovic

#39

Registration details

Registration date: 30 Jun 2021, 12:03
Registration state: Completed

Personal Data

Email Address: pavle.vulanovic@cern.ch

Please provide your question(s): I have a question about renormalization, where an electron is surrounded by electron-positron pairs. If that is how we define the electron, then should all the electrons which surround that electron, also have electron-positron pairs around them?

Lang Xu

#40

Registration details

Registration date: 30 Jun 2021, 13:57
Registration state: Completed

Personal Data

Email Address: lang.xu@cern.ch

Please provide your question(s): 1.How do I understand "all matter particles come with anti-particles" as a consequence of the Dirac equation? 2. A meson consists of a pair of quark and anti-quark, why these two quarks won't annihilate?