

4b) Start off doing a little dimensional analysis that will turn out to have shockingly large ramifications.

- Do the dim. analysis
 - Draw ^{very} naive conclusions
- } Skips ~~over~~ 40 years of massive confusion in the field late 30's - late 60's

The infinities that emerge when you actually do calculations, clouded these results, turns out to all be a red herring.

Correct way of thinking about it is "Wilsonian Way" EFTs

There is something deep underneath that legitimizes the naive answer, but it turns out the simple answer is correct.

One of the most important things that happened in physics in the last 50 years is understanding this deeper way of thinking about QFT.

"Could tell you the words, but won't appreciate until you suffer the normal bad way of talking about it"

What are the units of the fields we just talked about?

- Easiest way of talking about this is using the Lagrangian formalism, but B/C we didn't talk about that it's more complicated.

$$H = \int \frac{d^3p}{(2\pi)^3} E_p a_p^\dagger a_p$$

read-off units of a

a - units E^{-2}

$$\phi_+ = \int d^3p a_p^\dagger e^{ipx}$$

ϕ_+ - has mass dimension 1