

EASTER VACATION ASSIGNMENT

This assignment should be written up in the format of a research paper as though it were a piece of original research.

Calculate the β -function for a non-abelian gauge theory with gauge group $SU(N)$ consisting of the gauge-bosons and n_f multiplets of *scalar* particles in the defining representation of the gauge group.

From the definition of a covariant derivative, obtain the Feynman rules for the coupling of the scalar particles to the gauge bosons.

Consider the renormalization of the coupling between a gauge boson and the scalars.

Draw the graphs which you would need to consider if you had approached the problem by considering the coupling between three gauge bosons, and comment on the results that you would expect to have obtained from such a calculation.