

Topic 14 – Electroweak Gauge Theory

Pre-Lecture Reading/Post-Lecture Summary

It is time to tackle perhaps the most complicated of all the fundamental interactions....the weak force. The everyday presence of the weak interactions is particularly complicated since it does not correspond to a currently manifest gauge symmetry (unlike E&M and QCD). To streamline our approach, we will start by looking at the fully symmetric version which surprisingly forces us to unite the weak interactions with electromagnetism. This unified electroweak interaction will still be quite complicated, in particular for its chiral nature. After a gauge procedure much like we saw for the other SM forces, we will discuss the eventual fate of the symmetry of this theory through spontaneous symmetry breaking. In time this will bring us to one of the most exciting discoveries in particle physics that occurred just a few short years ago. Then you will leave and be happy.