

## Week 6 – March 1/3, 2022

### The Standard Model of Particle Physics

#### Objectives

- Review Standard Model Chart, Particle Data Group Resources
- Identify 'long-lived' particles and how they are detected at the LHC
- Understand motivation behind Lagrangian formulation of the Standard Model
- Review Feynman Diagrams
- Practice deconstructing Lagrangian into processes

#### HW due Thursday Feb 3<sup>rd</sup>:

- Prepare 2-min review of your particles
- Submit Feynman diagram of last week's paper

#### Class Outline

- Intro to gauge transformations
- Standard Model Summary
  - Quarks vs leptons: Baryon and Lepton number
  - Neutrinos: oscillations and other mysteries
  - Bosons: manifesting gauge symmetries
  - CKM and PMNS Matrix
- Typical Particle interactions in detectors
  - General purpose detectors => ATLAS/CMS
  - Specialized => ALICE/LHCb
  - Future
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